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ABSTRACT

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free library program for those unable to read standard printed materials, reproducing and distributing works in braille, recorded disc, and recorded cassette. A previous study of the distribution network identified costs and developed two alternative centralized service models, one for provision of braille book storage and distribution, and the other for audio playback facilities. This study explores the implementation of the centralized braille services previously recommended as a comprehensive centralized service with regional centers, with circulation services and direct patron contact at the centers. How to establish the centers and how to conduct the transition are described, outlining the transitional steps for: (1) fundamental decisions; (2) automatic data-processing development; (3) equipment and facilities; (4) operations services; (5) setup; (6) beginning operations; (7) monitoring operations; (8) estimated costs; and (9) planning and control. Six exhibits illustrate the process. (SLD)

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ED 371 757

Study I, Part 2

TRANSITION PLAN FOR BRAILLE CENTRALIZATION

Prepared For:
Library of Congress
National Library Service for the Blind
and Physically Handicapped

March 4, 1994
Contract Number: I70251

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STUDY I, PART 2

FINAL REPORT

TRANSITION PLAN FOR BRAILLE CENTRALIZATION

Contract Number I70251

ManTech Technical Services Corporation

MARCH 4, 1994

This work was sponsored by the National Library Service for the Blind and Physically Handicapped, the Library of Congress.

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Library of Congress at the time of publication. This report does not constitute a standard or regulation.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADP	Automatic Data Processing
ASCII	American Standard Code for Information Interchange
BLND	Database of Materials in NLS Collections
BR	The Standard Braille Collection Currently Housed in Network Libraries
CASE	Computer Aided Software Engineering
CBD	Commerce Business Daily
CD-ROM	Compact Disk Read Only Memory
CMLS	Comprehensive Mailing List System
COTR	Contracting Officer's Technical Representative
CSF	Critical Success Factor
DBMS	Database Management System
DPA	Direct Patron Access
DRA	Data Research Associates
ER	Entity Relationship (Diagram)
FAX	Telefax Communication
FY	Fiscal Year (Federal)
GFE	Government Furnished Equipment
GSA	General Services Administration
GUI	Graphical User Interface
HP	Hewlett-Packard
ID	Identification (Number)
IVR	Interactive Voice Response
LAN	Local Area Network
LOC	Library of Congress
MLA	Machine Lending Agency
MSC	Multistate Center
MTSC	ManTech Technical Services Corporation
NLS	National Library Service
NLSNET	NLS Communications Network
PC	Personal Computer
PICS	Production Information Control System
RA	Reader Advisor
RARL	Reader Advisor Regional Library
READS	Reader Enrollment and Delivery System
RFP	Request for Proposal
RL	Regional Library
SRL	Subregional Library
TBD	To Be Determined
TDD	Telecommunications Device for the Deaf
TMC	Technology Management Corporation
UNIX	A popular multi-tasking operating system
URB	User Review Board
USPS	United States Postal Service
WAN	Wide Area Network

SECTION 1

INTRODUCTION

Section 1
INTRODUCTION

This section of the report presents an introduction to the Study I, Part 2 transition plan of the implementation project. The background and objectives of this effort are initially presented, followed by a discussion of the format of the report.

1.1 BACKGROUND

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free national library program for persons who are unable to read standard printed materials due to physical and/or visual impairments. In cooperation with authors and publishers of books and magazines, NLS is granted permission to mass-produce copyrighted works. NLS works with a network of state, local, and private libraries and agencies, which provides the necessary resources for the storage and distribution of the NLS materials, and provides a direct interface with the patrons of the service. Books and magazines in braille, recorded disc, and recorded cassette format, as well as specially designed playback machines and accessories, are delivered to eligible patrons by postage-free mail, and returned to network libraries and agencies in the same manner.

The free national library program consists of three major components, each with its associated responsibilities, costs, and revenue sources. NLS, funded by Congress, secures copyright permission from authors and publishers; contracts with commercial and not-for-profit firms for the mass production of braille and recorded books and magazines, playback machines, machine accessories, and repair parts; and administers the program. The United States Postal Service (USPS), funded directly by Congress for this program, provides transport of program materials among network facilities, patrons, NLS, and points of book and machine manufacture and repair. The network, consisting of state, local, and private libraries and agencies, and funded by various combinations of federal, state, local, and private sources, provides the personnel, facilities, and other resources necessary to provide NLS materials to patrons. The combined expenditure for the entire program is approximately $120,000,000 annually, with the three major components bearing approximately equal portions of the total costs.

1.1.1 Network

There were four basic types of facilities in the network during federal fiscal year 1991. Fifty-six (56) Regional Libraries (RL) provide a comprehensive range of services, including services in addition to distributing NLS sponsored materials. Eighty-nine (89) Subregional Libraries (SRL) provide service to a specified part of a regional library's territory. Four (4) independent Machine Lending Agencies (MLA), in conjunction with the RLs, control and distribute NLS playback machines and accessories to patrons in a specified service area. Two (2) Multistate Centers (MSC), which are NLS agencies, distribute program materials and backup supplies to network libraries and agencies, as well as braille and recorded books from special and backup collections directly to patrons.

1.1.2 Previous Study

In 1989 and 1990, NLS contracted with Technology Management Corporation (TMC), a subsidiary of ManTech International and currently a division of ManTech Technical Services Corporation (MTSC), to perform a two-phase study of network operations. In the first phase of the previous study, TMC gathered information from a selected sample of network agencies, and network statistics compiled by NLS, and calculated both annual costs and a 15-year cost projection for NLS sponsored activities provided to patrons by the network. TMC found that the approximate costs of network operations for federal fiscal year 1989 (FY89) were $3,154,000 for braille book services, $7,724,000 for playback machine services, and $30,181,000 for recorded book services, for a total of $41,059,000 for all three services combined. In addition to the costs incurred directly by network agencies, NLS directly incurred approximately $805,000 in costs for its three multistate center operations of which $173,000 was for braille book services, $92,000 was for machine services, $387,000 was for recorded book services, and $153,000 was for publication and back-up supply services.

In the second phase of the previous study, TMC developed two alternative centralized service models, one for the provision of braille book storage and distribution services, and the other for the provision of audio playback machine storage, distribution, and repair. Both alternative models proposed that service be provided from two national centers, and each model was compared to existing service patterns at the time, i.e., 39 braille libraries and 57 machine lending agencies.

1.1.3 Study I, Part 1 Results

As a result of these previous studies, NLS determined that it was probably both feasible and economical to centralize braille book services and decided that the present implementation study be undertaken. The first phase of this implementation study, i.e. Study I, Part 1, was completed in November, 1992, the objective of which was to develop in detail the resource requirements, operating procedures, and projected costs of three options for centralized braille services. The three hypothetical options, selected by the study Advisory Committee in June, 1992, were then developed in sufficient detail in order to determine implementation feasibility on both a service and cost basis.

The analysis of each of the three options in Study I, Part 1 addressed resource requirements of all types, including automation, facilities, equipment, personnel, and other requirements. It also developed the most appropriate operating procedures to be employed at the braille centers. The analysis furthermore addressed operational goals and patron and network concerns about centralization as enumerated in RFP92-1 (which led to the current study) and as posed by the study Advisory Committee. Additionally, the analysis took into account results (not necessarily conclusions) from the previous studies, any applicable U.S. Government standards and requirements for automation and telecommunications, and any applicable existing or planned NLS systems. Finally, the analysis also addressed any impacts on agencies other than the centers themselves which would result from centralization implementation, and made recommendations on the most effective and efficient arrangement of the proposed centers vis-a-vis the existing MSCs.

The key elements of the three options evaluated in Study I, Part 1 as a result of the June, 1992 meeting with the Advisory Committee were:

- Option A:
  - Reader advisory services located at centers (and possibly at some network libraries)
  - Profile Select circulation capability located at centers
  - Direct patron contact with centers for all braille services
- Option B:
  - Reader advisory services located at network libraries
  - Profile Select circulation capability at network libraries, with a batch transmission of selected orders
  - Direct patron contact with network libraries for reader advisory services, and with centers to place specific orders (including a direct order feature)
  - Real-time data telecommunications access to center's ADP system by regional libraries
- Option C:
  - Reader advisory services located at network libraries
  - Profile Select circulation capability at network libraries, with a batch transmission of selected orders
  - Direct patron contact only with network libraries, none with centers
  - Real-time data telecommunications access to center's ADP system by regional libraries

For each of the above options evaluated and developed, the following assumptions applied:

- Braille books and back issues of magazines would be stored in, and distributed from, the centers.
- Some partial or complete collections could reside at some regional libraries... the extent of this deviation was never specified by NLS or the Advisory Committee.

- Automated systems at the centers would track only the NLS collections stored there, and would not track local collections that are not NLS property.
- Initial registration with the free library service would occur at network libraries only, not at the centers.

A draft report for Study I, Part 1 was then prepared which contained a discussion of the development and evaluation of each of the three options and included the recommended operating procedures to be employed, the resources required to effect implementation, and the estimated costs for each. This draft report was submitted to NLS September 8, 1992.

On October 13 and 14, 1992, a second meeting with the study Advisory Committee was held. At this meeting, the Study I, Part 1 draft report was reviewed and discussed, and a consensus was reached among ManTech, NLS, and the Advisory Committee on what should be the recommended centralized braille book distribution system.

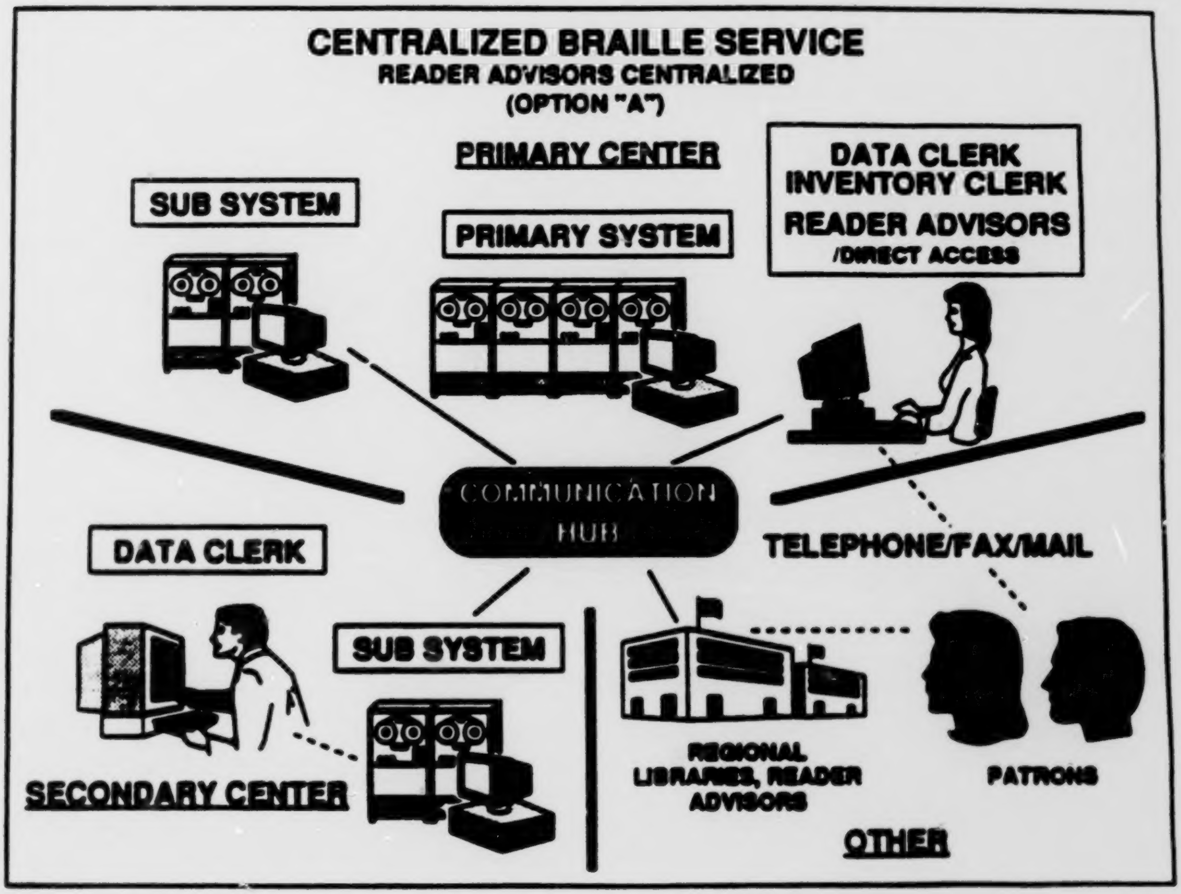
The recommended system is Option A, as defined during the first meeting in June, 1992, and as explained above, together with the following three major enhancements/differences that were not included in Option A in the draft report, but were added as a result of the second Advisory Committee meeting:

- A real-time data telecommunications access to the centers' ADP system, identical to that to be provided in Options B and C, would be provided to allow network libraries to continue to provide reader advisory services at the local level if they choose to make the minimum and/or desired modifications to their own ADP systems to facilitate access to the data telecommunications link,
- A direct patron access, Interactive Voice Response (IVR) capability would also be provided, like that provided for in Option B, and
- A capability to enroll patrons of non-participating libraries (i.e. those libraries that would not turn over their collections to the centers) with the centralized braille service would also be provided, although this enrollment would be subsequent to initial registration of the patrons by the non-participating libraries.

The final report for Study I, Part 1, was submitted to NLS November 22, 1992.

Exhibit 1-1 presents a diagrammatic representation of the final version of Option A at the highest level. For discussion purposes later in this report, the primary center as noted in Exhibit 1-1 is the Western Center, and the secondary center is the Eastern Center; whether the Western or Eastern center is to be made the "primary" center (wherein the primary ADP system and reader advisory services would reside) must be determined at some time after the conclusion of the study, but prior to the procurement of the resources and services necessary to effect implementation.

Exhibit 1-1


CENTRALIZED BRAILLE SERVICE
READER ADVISORS CENTRALIZED
(OPTION "A")
PRIMARY CENTER
SUB SYSTEM
PRIMARY SYSTEM
DATA CLERK
INVENTORY CLERK
READER ADVISORS
/DIRECT ACCESS
COMMUNICATION HUB
DATA CLERK
TELEPHONE/FAX/MAIL
SUB SYSTEM
SECONDARY CENTER
REGIONAL LIBRARIES, READER ADVISORS
PATRONS
OTHER

1.1.4 Study I, Part 2, Specifications Results

The development of detailed specifications for the enhanced Option A service model began in December, 1992 after the submission of the final Study I, Part 1 report in November, 1992. The specifications developed are to serve as the bases for statements of work and cost schedules in subsequent RFPs to effect the implementation of centralized braille services. The specifications for the enhanced Option A service model included additional detail beyond that contained in the Study I, Part 1 report so that adequate statements of work can be prepared by NLS for the envisioned procurements of the resources necessary to successfully implement the subject service model. However, the specifications developed are not RFPs or bid requests *per se*; the actual development of the RFPs and bid schedules to be used in any actual procurements are the exclusive responsibility of the NLS.

A draft report for the Study I, Part 2, Specifications was then prepared which contained the detailed requirements for the envisioned operations. This draft report was submitted to NLS April 7, 1993, and a revised draft of the ADP systems portion of the report was resubmitted to NLS on April 30, 1993.

On May 11 and 12, 1993, a third meeting with the study Advisory Committee was held. At this meeting, the Study I, Part 2 draft specifications report was reviewed and discussed, and a consensus was reached among ManTech, NLS and the Advisory Committee on what details should be included in the specifications in each of the three major resource areas: ADP systems; facilities, shelving, and equipment; and, operations. Furthermore, several changes were made to the enhanced Option A service model both as a result of the meeting, and as a result of additional direction provided by NLS, which constituted differences from the Option A service model presented in the final Study I, Part 1 report. The final specifications were provided to NLS on August 4, 1993.

1.2 OBJECTIVE OF STUDY I, PART 2, TRANSITION PLAN

This final report presents the recommended transition plan for the implementation of the enhanced Option A centralized braille services model selected by the Advisory Committee for implementation. The report incorporates all NLS and Advisory Committee comments received on the draft transition plan report (submitted July 29, 1993) and resulting from the fourth Advisory Committee meeting held September 20, 1993, and takes into account all changes to the enhanced Option A model resulting from the May 11 and 12, 1993 Advisory Committee meeting.

The primary objective of this report is to present a plan for transitioning from the present braille storage and distribution system to the recommended centralized system. The report includes transition details and estimated costs that are either not addressed at all in the options or specifications reports, or that are not addressed in sufficient detail to facilitate implementation by the NLS. All transition issues enumerated in the study RFP are addressed in this report, as well as several other issues.

However, this transition plan does *not* contain most of the detailed information contained in the options and specifications reports except in instances wherein such information is inherently pertinent to transition steps; in all other instances, relevant sections of the options and specifications reports are referenced. The transition plan essentially outlines the steps to be taken, and the sequence in which the steps should be taken, to successfully implement the recommended centralized braille services model.

Finally, issues that are out-of-scope from ManTech's perspective, e.g. how the recommended centralized operations will be funded, that are nevertheless relevant to the successful transition to the proposed operations are mentioned in appropriate locations throughout the report. However, such out-of-scope issues are not elaborated upon, but recommendations are offered as ManTech deems appropriate.

1.3 FORMAT OF REPORT

The overall format of the Study I, Part 2 transition plan report was essentially determined by ManTech, with an outline submitted to NLS for comments, and the comments subsequently integrated into the format of the report. The report is structured as described below, which effectively lays out the steps to be executed in the transition plan in the recommended chronological sequence, albeit that there is some overlap between certain steps.

- Section 1 contains an introduction to the report, including the background to both the current study and this report, the objectives of this report, and its format.
- Section 2 contains a discussion of both fundamental decisions that must be made by the NLS and Advisory Committee prior to any procurements being undertaken to implement centralized services, and several steps that must be undertaken by the NLS prior to the initiation of procurements.
- Section 3 contains a discussion of steps to be taken and considerations relevant to the procurement, design, development, and testing of the specified ADP systems, subsystems and peripherals.
- Section 4 contains a discussion of steps to be taken and considerations relevant to the procurement and/or lease and set-up of facilities, shelving and other equipment for the specified centralized operations.
- Section 5 contains a discussion of the steps to be taken and considerations relevant to the procurement and selection of operations services for the specified centralized operations.
- Section 6 contains a discussion of the steps to be taken and considerations relevant to the initial set-up of operations for the specified centralized operations.
- Section 7 contains a discussion of the steps to be taken and considerations relevant to the commencement of normal, continuing operations at the specified braille centers.
- Section 8 contains a discussion of the steps to be undertaken and considerations relevant to the monitoring and modification of the specified central operations.
- Section 9 contains a discussion and presentation of cost estimates for steps to be taken in the transition to the specified centralized operations that were not presented in the two previous reports.

- Section 10 contains an overall presentation of the recommended transition plan in the forms of both a graphical flowchart and a tabular checklist.

SECTION 2

MAKE FUNDAMENTAL DECISIONS ON CENTRALIZATION

Section 2

MAKE FUNDAMENTAL DECISIONS ON CENTRALIZATION

This section of the report contains a discussion of both fundamental decisions that must be made by the NLS and Advisory Committee prior to any procurements undertaken to implement centralized services, and several steps that must be undertaken by the NLS prior to the initiation of procurements.

2.1 MAKE CENTRALIZATION DECISION

The first and foremost decision to be made by the NLS and the study Advisory Committee upon the conclusion of the Study I effort is whether or not to proceed with the implementation of the proposed and specified centralized braille services that are documented in the three Study I reports (inclusive of this report). Although the "go/no-go" decision may be strongly influenced by financing (funding) aspects of the proposed operations (ref. Subsection 2.2), ManTech recommends that NLS and the Advisory Committee employ a basic two-step approach in the decision process. This two-step approach essentially considers the "investment" decision independently and separately from the "financing" decision, i.e. if a change in the subject operations makes sense from both an efficiency and effectiveness perspective, the investment decision is made in the affirmative, and the means of funding the acquisition of capital assets and the support of continuing operations are then, hopefully, worked out in a separate step.

ManTech strongly recommends that the proposed centralized braille services operations be implemented. The benefits of the proposed operations are presented in detail in Subsection 2.3 of the Study I, Part 2 Specifications report, and are summarized below.

- Better availability of materials to braille patrons will result from the pooling of inventories which are now distributed, hence mollifying the effects of random demand and significantly reducing the incidence of stockouts.

- More flexibility with regards to new production of braille, such as more titles and/or more copies of popular titles at no additional cost, will result from the implementation of centralization due to the need to maintain inventory at two storage locations rather than 39 locations.

- Better inventory control of the national braille collection will result from centralized inventories being more easily controlled than distributed inventories (other things being equal), a contractual relationship between NLS and the centers' operators (rather than a cooperative, associative relationship), the performance of true, annual physical inventories, and the strong location orientation of the proposed ADP system.

- More efficient storage of the braille collections will result from the employment of much lower unit cost facility storage space (approximately one-half to one-third of current unit costs), the realization of much higher storage densities (approximately 2.5 times higher than current library storage), and the use of random storage instead of title sequence storage (approximately 15%-20% more efficient).

- More efficient distribution of the braille collections will result from the use of forward (quick turn) shelving to reduce order selection time, the use of bar code scanning equipment to expedite all distribution functions, the use of random storage to reduce putaway time, the bar coding of patron address zip codes and the centers' address zip codes to expedite mailings and returns, and separate USPS deliveries and pickups to facilitate same day shipments of orders.

- More services to patrons will result from offering a Direct Patron Access-Interactive Voice Response (DPA-IVR) feature, and a patron modem access to the primary system to facilitate queries and the placement of orders, reserves, and requests by patrons.

- Better information on readership, circulation, and collections will result from the consolidation of braille services together with the employment of an ADP system designed to provide such information, which will aid in both new title production and weeding decisions.

- There is to be flexibility with regard to both network library participation in the program, and with regard to whether a network library or the center provides reader advisory services to patrons.

- An ability to manage and track the proposed new mailing containers will be facilitated by the bar code scanning and ADP inventory control systems at the centers, which will be a requirement if the use of the new containers is to be controlled.

- Lower overall costs to the free library program will result from the use of lower cost facility space, economies of scale in both distribution and storage functions, and the employment of modern operating techniques, optimal facility layout, and comprehensive ADP support in the storage, distribution, and inventory management functions.

The downside to centralized services is that a transition must be made from the *status quo* to the proposed operations, and some efforts, costs, and "growing pains" will inevitably be incurred in this transition. Additionally, patrons would receive braille service from one entity, and recorded book, magazine and machine service (an estimated 95% of braille readers are also recorded book readers) from another entity. However, this latter aspect of the service is expected to present only a minor problem as this situation already exists for a large proportion of braille readers, given the split service arrangements for patrons of subregional libraries and patrons who receive braille service from another state.

In conclusion, the decision to centralize or not centralize braille services is a long-term decision that must be made by the NLS and the Advisory Committee with the best interests of patrons, and the feasibility of implementation, being the primary criteria to consider. It is ManTech's unbiased opinion (ManTech is contractually precluded from performing any direct or indirect work, as prime or subcontractor, in the proposed implementation) that centralization should be implemented. If and when the decision is made to centralize, this basic decision should be promulgated to the network and to patrons via NLS publications. However, certain specifics of the transition would not yet be decided upon at this juncture, and subsequent communications with patrons will be necessary, which are cited later in this report.

2.2 MAKE FUNDING DECISION

The method for funding the proposed and specified centralized braille services must be decided upon by the NLS and the network, either through the auspices of the study Advisory Committee, or via some other forum, using the technical and financial information contained in the three Study I reports as required. It goes without saying that the specified centralized services cannot be implemented unless adequate funding is secured, whatever the source(s). If both the centralization decision is made in the affirmative, and if adequate funding can be secured, then implementation can proceed; else, the concept should be dropped for the foreseeable future. The majority of costs associated with the proposed implementation are documented in Appendices 2-10 to 2-13 in the Specifications report, with additional estimated transition costs not contained in those exhibits shown in this report in Section 9.

The funding issue is outside the scope of the study from ManTech's perspective, hence no formal recommendations are offered. However, the following informal recommendations and points are made concerning funding issues.

1. The project implementation is a long-term effort, with the total estimated time from the decision to implement to the conversion of the last patrons and materials in the order of eight years, with some uncertainty in this estimate being due to several factors.

2. Although the two previous reports categorize costs as one of three types (i.e. start-up, conversion, or operating), from a funding perspective there are two types of costs. Capital expenditures will be required for all purchased assets, and operating expenditures will be required for all continuing expenses such as lease payments, utilities, services, labor and materials. There will be large up-front costs for facilities and shelving (if purchased) and for ADP systems development, and continuing expenses to support operations and conversion costs (the latter for the first five years). If both the facilities and shelving are leased, the up-front costs are very modest with the continuing costs being more substantial.

3. Unless NLS and participating network libraries form a legal entity to oversee the centers and hold lease and title over the assets located therein, in all probability NLS will have to hold lease and title over all assets. Whether or not NLS would have to completely bear these costs is another matter.

2.3 LOCATION OF PRIMARY CENTER

Given both the decision to proceed with centralization, and the required funding secured for both necessary capital acquisitions and continuing expenditures, the next decision to be made by NLS and the Advisory Committee is whether to locate the primary center (wherein reader advisory services and the primary ADP system would be located) in Salt Lake City, Utah or in Cincinnati, Ohio. ManTech has been directed by NLS to leave this decision to the committee and to NLS, but to nevertheless enumerate the pros and cons of locating the primary center in each of the two areas. These points are listed below.

- A disadvantage to locating in Salt Lake City, and an advantage to locating in Cincinnati, is the ability to staff the center's office during the workday in local time, i.e. 6 AM to 6 PM Mountain Time versus 8 AM to 8 PM Eastern Time. However, given the relatively small staff of the office and the labor pool in an area the size of Salt Lake City, the office could certainly be staffed.

- An advantage to locating in Salt Lake City, and a disadvantage to locating in Cincinnati, are the relative costs of facility space and labor, both of which are lower in the former. However, the differences between the two locations in both areas is slight, not significant.

- A disadvantage to locating in Salt Lake City, and an advantage to locating in Cincinnati, is both the proximity of the primary center to the majority of patrons, i.e. Cincinnati is closer to the majority of patrons and having the primary ADP system co-located in the same facility that has the largest number of transactions. However, geographic proximity is truly not a factor in the level of service, since materials will be issued from the center closest to a patron thus minimizing delivery time, and the difference in telecommunications (voice and data) connect time costs are insignificant given current pricing practices in the industry.

- An advantage to locating in Salt Lake City, and a disadvantage to locating in Cincinnati, is that *if* the Utah State Library is the successful offeror for the proposed operation, then the operator will have prior experience offering comprehensive centralized braille services to patrons with no true equivalent in Cincinnati. However, it is neither a given that the Utah State Library will bid on the proposed work nor be the successful offeror, nor are the proposed and specified operations identical to the service currently being provided by the Utah RL.

- A disadvantage to locating in Salt Lake City, and an advantage to locating in Cincinnati, is proximity to the NLS for travel associated with monitoring the primary center, the latter being the closer. However, the incremental differences in both travel time and money for these activities are relatively insignificant given the total costs and scope of the proposed and specified operations.

2.4 DETERMINE EXTENT OF NETWORK PARTICIPATION

Throughout Study I, including this report, the assumption has been made that there will be 100% participation in the proposed and specified services by network braille libraries, participation being defined as turning over existing BR collections and future BR production allocations to the centers (excepting what is loaned or given back in the way of deposit collections to libraries themselves). ManTech has never been provided with any other information or basis for participation, so the 100% participation rate assumption was made and stated clearly early in the study, and has not changed since.

However, it has been alluded to by the study Advisory Committee and by the NLS that several braille libraries may not wish to participate in the proposed program. Although NLS has the legal authority both to request the transfer of existing BR collections and to allocate future BR production exclusively to the centers, NLS has indicated that participation in the program is to be voluntary, not mandatory, and that libraries that choose not to participate in a centralized braille service would continue to receive new braille books from NLS producers. However, ManTech highly recommends that NLS strongly encourage network participation in the program for the good of all parties involved.

Therefore, the next step that the NLS and/or Advisory Committee must take is to determine the extent of network participation in the program by directly communicating with each and every existing braille library and receiving a definite yes/no commitment from each (explaining that there would be some flexibility with regard to when they would be transitioned into the new system within a proposed four-year network library collection and patron conversion phase). This knowledge is essential, since the facility space and shelving requirements, and the collection conversion workload, are direct functions of the collections to be housed in each center.

Based upon the response received, the NLS must recalculate the facility space, shelving, shelf labeling, and collection conversion requirements for the two centers if any braille libraries choose not to participate, because the specifications are based upon 100% participation. With the specifications modified as a result of any non-participation, procurements can proceed for facilities, shelving, and operations.

Required staffing levels for both office and floor operations distribution functions will also be affected by non-participation, but not on a one-for-one, patron-for-patron basis because patrons from non-participating libraries will still be eligible for service from the centers. Therefore, NLS should also solicit an estimate from the non-participating libraries of the number of their patrons who may nevertheless choose to receive service from the centers, and possibly use this information to modify the specifications for the centers operators' staffing levels.

2.5 DETERMINE NUMBER OF READER ADVISOR REGIONAL LIBRARIES

Throughout Study I, including this report, the assumption has been made that 100% of participating libraries in the proposed and specified centralized services will have their patrons contact the primary center for reader advisory services, i.e. there would be no reader advisor regional libraries, with regards to sizing both reader advisor staffing and telecommunications (both voice and data) requirements in the primary center office. ManTech has never been provided with any other information or basis in this regard, so the 0% reader advisor regional library assumption was made and stated clearly early in the study, and has not changed since.

Of course, the specified ADP system is to provide for data telecommunications access by any such libraries that choose to make the required and necessary ADP investments in their own systems to facilitate such access. However, ManTech recommends that NLS encourage network libraries to have patrons utilize the reader advisory services at the primary center.

Because some participating libraries may wish to provide reader advisory services locally and make the required and/or desired investments to facilitate data telecommunications access to the primary ADP system, NLS must determine the number of such libraries and the patrons involved. This could be performed in a separate step from that discussed in Subsection 2.4 above, but should logically be performed in that same step. This knowledge is important, since reader advisor staffing and telecommunications (there would be a shift from voice to data telecommunications traffic at the primary center with an increasing number of reader advisor libraries) requirements are a direct function of the number of libraries that choose to provide such services to their patrons rather than having the primary center do so.

Based upon the responses received, the NLS must recalculate the required reader advisor staffing and estimated telecommunications traffic for the primary center if any braille libraries choose to provide their own reader advisory services, because the staffing and voice telecommunications specifications are based upon 100% of reader advisory services being provided by the primary center. With the specifications modified (if appropriate), a procurement can proceed for center operations with modified staffing requirements and voice telecommunications workload, and the modified voice and data telecommunications traffic information can be provided to prospective offerors for the ADP systems.

2.6 DETERMINE CONVERSION PERIOD AND SEQUENCE

With the number of both participating and reader advisor regional libraries determined (with participation being the relevant consideration), the period for converting both patrons and collections from network braille libraries to the proposed and specified centers must be determined. The period ManTech recommends for conversion (ref. Section 7) given 100% participation is over a four-year period following the one-year set-up phase of the centralized operations wherein MSC collections will be converted. This phased approach should facilitate a smooth conversion of both patrons and materials into the new system.

However, if a number of libraries choose not to participate, the conversion of books and patrons from network libraries to the centers can take place over a period of less than four years. Depending upon the results of the aforementioned surveys and communications, the transition schedule should be modified to reflect any reduced collection and patron conversion requirements.

With the time period for conversion finalized, the sequence in which network libraries' patrons and BR collections will be converted to the centralized system is to be specified by NLS and the network, and has not been specified by ManTech in this report, per NLS direction. Various possibilities exist regarding the ordering of individual libraries in the conversion, and specific considerations may apply. Whatever the order of individual library conversion selected, it should adhere to the established time frame with an essentially uniform distribution over time, i.e. an effectively constant collection and patron conversion workload over the four years (or less).

2.7 DOCUMENT TRANSITION MANAGEMENT PLAN

With the aforementioned decisions and communications made, and information collected, the next step to be performed is the documentation of a transition management plan by the NLS. The transition management plan should use this report as the basis for the plan, but should also consider the input of LOC procurement personnel with regard to procurement time estimates to be incorporated into the schedule for the establishment of procurement milestones. This is especially important with regard to how long after (if after) the procurement(s) of the ADP systems are initiated that the procurements of the facilities (whether purchased or leased) should be initiated.

Transition management responsibilities within NLS should first be assigned. An overall transition manager should be designated who would have overall responsibility for the migration of the current system to the proposed system, and authority to intervene in all aspects of the transition, including procurements, interaction with the Advisory Committee, and on-site evaluation of the centers' assets and operations. Specific responsibilities for other aspects of the transition, e.g. ADP systems procurement(s) or network/patron communications, should also be assigned as appropriate to other individuals, under the supervision of the transition manager.

Each major step in the proposed transition should be monitored by some responsible individual within NLS with regard to adherence to schedule milestones and the quality of the services and/or assets being provided by contractors in the implementation. Schedule milestones should be established after discussing the proposed transition with LOC procurement personnel. Uncertainties other than procurement times will also impact the schedule, such as the variance in the time to final ADP systems verification, variation in the facility retrofit or construction time, etc. For these reasons, it will undoubtedly be necessary at one or several times during the transition to revise portions of the transition management plan.

2.8 PROMULGATE INFORMATION TO NETWORK AND PATRONS

With the initial transition management plan finalized, it is recommended that NLS promulgate to both the network, and especially to patrons, important aspects of the planned transition (network libraries will probably be more aware of the specifics than patrons at this point in time). It was previously mentioned in Subsection 2.1 that patrons and the network should be informed of the "go/no-go" decision after it is made, but that not many other specifics would be available at that juncture. However, after formulation of the initial transition management plan, certain other specifics of the plan should be conveyed in some comprehensive form of communication to both the network and to patrons.

SECTION 3

ADP SYSTEMS DEVELOPMENT CONSIDERATIONS FOR TRANSITION

Section 3

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This section of the report addresses the efforts required for the design, development and implementation of the ADP system to ensure successful transition to centralized braille services. Discussed in this section are the issues related to the ADP transition; considerations that NLS needs to be aware of in procuring the required ADP services, support, software, and equipment; and the required tasks to be accomplished during the system design, development and operational phases.

3.1 ADP SYSTEM TRANSITION OVERVIEW

There are many activities to be undertaken to ensure successful transition to centralized braille operations, one of which is the design, development, installation, test and operation of an automated system. The transition plan presented herein reflects the three basic phases of the ADP System Life-Cycle: Design Phase, Development Phase, and Operational Phase. All of the activities to be accomplished for successful ADP transition fall within one of these three classically defined phases. Exhibit 3-1 lists the major activities that NLS must plan for and accomplish during the transition to the new ADP system and supporting infrastructure.

3.2 ADP ISSUES

The transition to centralized braille services relies heavily upon the design, development, and test of an operational ADP system(s) to support the functional areas that have been defined: Reader Advisory, Circulation, and Inventory Control. It is imperative that the system(s) be designed, developed, tested and fully operational prior to the conversion of books, data, patrons and functional/operational responsibilities to the braille centers.

Exhibit 3-1
Major Activities to be Accomplished by NLS for Transition Regarding the ADP System

A. Resolve outstanding issues and make final decisions affecting ADP design.

B. Prepare ADP procurement package(s), advertise in the CBD, and disseminate RFPs.

C. Conduct a pre-bidders conference to discuss with potential bidders the ADP requirements and study background, and answer any questions previously submitted.

D. Arrange a reading room for potential bidders to access appropriate NLS documentation.

E. Evaluate submitted proposals and make award.

F. Conduct a Contract Kick-off meeting with the successful bidder. Provide all necessary documentation to the support contractor during the meeting. Establish a User Review Board (URB) to support the contractor throughout the contract period. Provide support in the development of the ADP Management Plan.

G. Review the ADP Management Plan and negotiate with the software support contractor until all parties have a clear understanding of the scope of the effort. This is critical if NLS decides the procurement is to be firm-fixed price to avoid out-of-scope issues with cost/schedule impacts. Additionally, the scope must be clearly defined if the software support contractor is to provide a free maintenance or warranty period following the installation and operation of the system.

H. Begin the Software Design Phase. The URB may have begun development of the logical data model. If so, they should complete the model while the software support contractor is preparing the hardware and software packages recommendations. The model should be given to the contractor with all supporting documentation. If the URB has not performed this task, the URB should be available to the contractor in order for the contractor to accomplish this effort. The URB should provide comments on the logical database design prior to the physical database design effort.

I. Procure the recommended and approved software packages and hardware suites to support this effort. The suites may be used by the development team, and must be in place prior to the conclusion of the design phase. Other equipment with which the ADP system will interface will need to be specified, but does not need to be in place until development is almost complete and unit testing has begun.

J. NLS should prepare the test data that will populate the test database and simulate the other systems from which data will be downloaded. This will need to be provided to the software support contractor at the beginning of the development phase.

K. The URB needs to be available to review deliverables and participate in system demonstrations. The URB will also be responsible for the user acceptance testing.

L. NLS will be responsible for maintaining the transition schedule. Some activities are dependent on other activities, e.g. the ADP system cannot be installed at the braille centers until all facility requirements have been satisfied, office and floor operations furniture is in place, and the operational site hardware suite has been received from the hardware vendor. Centralized services cannot be provided until the ADP system has been fully tested, populated, and has become operational.

M. Title information needs to be downloaded from the applicable databases to populate the center's system prior to books being converted from the MSCs and regional libraries to the centers. Data from the other automated sources (CMLS, PICS, BLND, READS) needs to be downloaded to populate the primary center's system before the system rollover. Furthermore, all RLs (participating and non-participating) must review and correct CMLS patron data before initial download to the primary system, and again (in the case of participating libraries) just before each RL is rolled into the centralized service. The software support contractor will be responsible for this activity; however, NLS will need to coordinate the effort among all involved parties (NLS system administrators, other support contractors, etc.). It may be required that the other systems will need to be modified to accommodate the required interface to the center's system. If so, NLS will need to task the responsible parties to complete these modifications during the conversion efforts. Lastly, NLS must develop (or contract out development of) a subject coding system for braille books, which must result in clear, unambiguous definitions of the subject codes to be employed by the primary ADP system in the centers.

N. Regional libraries need to provide patron HAS HAD, NOW HAS (to be entered as Has Had data in the primary system), reserve, and request information to the center to populate the ADP systems during a four-year patron conversion process.

O. Service preference data will be collected from the patrons directly by the primary center's staff as one of the system rollover efforts during the four-year conversion. Following the download of patron data from CMLS, patrons will be contacted and surveyed regarding preferences for reading materials and types of services. A data entry screen should be developed by the software support contractor for this initial data collection effort, such that the data can be entered and verified during the telephone conversation. The system will be designed and developed to accommodate routine updates to this data, once the system has become operational.

P. Documentation should be updated and finalized once the system becomes operational to reflect the "as built" system, vice the "as designed".

There are several key decisions that must be made by NLS in support of the ADP effort. There are also outstanding issues that will affect the direction to be taken during system design and development, and these issues need to be addressed by NLS prior to commencing the system design effort. These issues are discussed in the following paragraphs.

1. NLS has not made a final decision regarding the implementation of the braille center concept. The study remains within the feasibility and cost/benefit analysis stage. There will most likely be a considerable lapse of time between the completion of this study and the actual design and development of the ADP systems to support the concept. It can be expected that there will be considerable changes in software, hardware, and communications technology during this period. Additionally, there will be on-going changes and enhancements to current NLS ADP systems and communications systems. These will affect the design of the braille center ADP systems and will need to be recognized and addressed by the software support contractor when designing the hardware, software, and communications architectures.

2. Related to the above discussion, NLS needs to decide what data architecture, software architecture, and operating environment will be put in place to support the braille center concept. Areas for discussion may include the feasibility and

desirability of merging several current NLS ADP systems (e.g. PICS, READS, CMLS, or NLSNET) with the centralized distribution system. If this is a direction that NLS would like to pursue, then the logical data model developed during the design phase should incorporate all data needs of the NLS and the regional libraries. The initial development effort could be directed at just those areas that support the centralized functions, with future required enhancements defined during the design process. This would be more efficient during the design phase than waiting until after the centralized system is operational and then planning the expansion. Currently, the centralized system is specified to interface with existing systems with only a one-way download of data to the centralized system. This will require redundant data storage which could be eliminated if NLS decides to integrate some, if not all, existing systems with the new design. If all current systems will continue to exist as they do today, the design of the system and the architecture infrastructure will be mandated to interface with these systems in some fashion.

3. In the event that NLS makes the decision to expand the scope of the centralized ADP system, consideration should be given to implementing a multi-user, distributed environment. Currently, this capability is being supported by the Oracle, Sybase, and Ingres database software languages. This could change during the period between now and when the NLS commences the design effort. The NLS needs to decide, either independently or with the assistance of a consultant, if the database(s) to be developed will be relational, and if so, specify which Data Base Management System (DBMS) is desired. The operating system will also need to be chosen, e.g. UNIX based Oracle on an HP server could be a solution. It is recommended that NLS include a task in the Statement of Work for the software procurement requiring the support contractor to conduct a software/hardware/communications analysis and provide architecture recommendations. Benefits to be derived should be included. Once the architecture has been defined, the NLS will need to procure the appropriate hardware and software packages, possibly from the GSA schedule.

4. The NLS will need to decide if the subject ADP services are going to be procured in separate packages, or if one turn-key procurement package is desired. If services are procured separately, the NLS will have to function, more or less, as the prime contractor. The NLS would have to ensure that all efforts were thoroughly coordinated and that all equipment was delivered on time, and in synchronization with, the support software development. Any delays or oversights in coordination could prove very costly for the NLS. A turn-key system package would require that the support contractor provide all required items to include hardware and software packages. It may be more economical for the NLS to procure these items off the GSA schedule vice having the support contractor responsible for procurement. It is presumed that these procurement costs would be less if procured by the NLS directly. Depending

on the contract type to be awarded, the NLS may solicit the contractor to provide price estimates for the items recommended. If the prices are better than what the NLS can obtain, the NLS may consider a modification to the support contract to include procurement of the items through the software support contractor.

Since computer technology is constantly changing, leasing of the equipment should not be overlooked. The NLS may wish to request costs for leasing the equipment, with maintenance included, as a separate item in the contractor bid. Leasing would provide for flexibility, allow for adaption to new technology, and accommodate growth in the outyears.

5. There are really no issues that will affect the actual database development effort, once the operating system, DBMS, database architecture, and hardware architecture have been established. During the design stage the logical data model will have to be developed, followed by development of the physical model. The NLS personnel could begin the logical data modeling effort prior to award of the software support contract. If any significant progress is made on the modeling effort, it is recommended that the model, although incomplete, be added to the procurement package as additional information for the bidder. If this effort is performed by the NLS, the support contractor will be tasked to analyze the model and make changes as necessary for efficiency. If the task is not performed by the NLS, the support contractor will undertake this effort early in the design phase. The NLS personnel will have to be intimately involved with the support contractor when developing the data model. It will need to be reviewed in depth with regional library personnel to ensure its completeness and that all business rules have been reflected correctly. The NLS may desire to revisit some of the business rule decisions previously made to determine if they are still applicable at the beginning of the design effort. (For instance, patrons must be associated with a regional library and cannot be registered through the primary distribution center). The NLS can either dictate which CASE tool will be used in the development of both logical and physical data models, or can request that the support contract bidder recommend the CASE tool, with supportive information regarding the benefits of using that particular tool.

6. The NLS needs to establish a User Review Board for assisting in the design of the ADP systems and for reviewing all design documentation developed. It is imperative that the User Review Board come to some consensus quickly regarding the capabilities to be supported, the user interfaces to be developed, and the output products to be generated during the design process. Any issues that continue to remain unresolved or awaiting final decision should be considered as potential modifications for the ADP system after the ADP system

becomes operational in order to facilitate the design and development efforts in satisfying the established milestones.

7. User interfaces require some discussion and decisions. Does the user view to be developed for the centralized system need to parallel the interfaces provided by the existing NLS systems? It is recognized that the interface needs to be user-friendly and intuitive, but the added requirement is that it be useable by blind and physically handicapped individuals via special adaptive devices. Access by special adaptive devices to the system is required. The use of icons in such an environment will not work particularly well.

8. The User Review Board should consist of individuals from NLS, selected Advisory Committee members, and selected Patrons. The number of individuals should be kept to a minimum and include those who can best reflect most of the basic functions to be addressed by the ADP system. Too many individuals assigned to the User Review Board will cause unnecessary delays in the design process and will prove inefficient, especially if the design cannot proceed without the consensus of all members. Too few members increases the risk that not all design requirements are addressed during the initial design effort. Members will need to be chosen carefully.

9. Screen designs should be reviewed by the User Review Board (NLS representatives, and selected Advisory Committee Members to include braille regional library RAs and patrons) during the detailed design stage. The designs should not be expected to be functional, but should provide a "look and feel" to the User Review Board to ensure that design is proceeding in the right direction. The user interface is one of the most important aspects of the system design.

10. One issue that needs to be resolved prior to the procurement package being disseminated is the software and hardware maintenance issue. For the developed software, the NLS could include a task to be costed by the bidder to supply software maintenance on an on-call, time and materials basis in accordance with the specified time frames established for responsiveness. The NLS might require that the software vendor provide a free six-month warranty period following delivery of the fully tested and operational system. A clear definition of "bugs" requiring maintenance will need to be developed. Obviously, errors encountered that are within the scope of the development effort and outlined in the test plan should be considered "bugs". It becomes less clear when modifications can be interpreted by one party as a "bug" and by another party as an enhancement that was not included in the original scope of the effort. Another alternative could be a separate maintenance contract following delivery of the operational system; however, this is not recommended for the period immediately following delivery of the system. First, resources would need to

be expended by the NLS in preparing the RFP, and second, award to another vendor would introduce potential risk due to the required learning curve.

For hardware, the NLS may consider procuring the maintenance contract provided by the vendor. Normally, there is some free maintenance provided for a specified period of time, with a clause for on-site maintenance on an hourly cost basis. It may prove more economical to only request hardware maintenance on an as-needed basis from a local vendor, especially if the hardware is known to be reliable.

11. Another issue that affects the timing of the ADP procurement, and the beginning of the system development effort, is the decision by the NLS as to whether they will provide developmental hardware and software to the software support contractor, or if the support contractor will provide their own. If the NLS decides that it will provide the required items, then the procurement of these items will need to be expedited since the procurement lead time may be as long or longer than the system design time. Additionally, if the NLS anticipates future expansion of the system, which will require that the software support contractor keep the established development lab, then the NLS will need to procure the identical suite of items for the operational sites. These will need to be received, installed, and tested prior to moving the developed software to the operational site. Additional testing will be required at the operational site, to include the installation and user acceptance testing.

12. It has been decided that once the ADP system is operational at the braille centers and normal operations have commenced, that a survey will be conducted of the patrons to ascertain their reading preferences and other pertinent data. This was the NLS approved method of obtaining this information, vice collecting this information from the regional libraries. The software support vendor should develop a data entry screen to facilitate entry of this data.

13. NLS should consider "advertising" the new services and procedures as soon as they become known. This should initially be in the form of a pamphlet, with more detailed procedures to be provided at a later date. Different types of pamphlets should be published based on the particular user being addressed.

14. The ADP conversion and rollover efforts must be closely coordinated with all other efforts to be accomplished to ensure a successful transition. This will require the cooperation and assistance of the regional libraries and the system administrators with which the center's ADP system will interface.

3.3 PROCURE ADP SERVICES

Consideration needs to be given first to whether the required ADP hardware should be purchased or leased. Then a decision needs to be made as to whether the required software packages and computer hardware should be procured under a service contract whereby the items would be obtained by the selected software support contractor, or be acquired directly by the NLS. Regardless of the method used to obtain the equipment, this decision must be made before the RFP is developed and published.

It is envisioned that the NLS will prepare one RFP procurement package for the ADP systems in support of the centralized operations. This package will be either a request for a turn-key system whereby the successful bidder provides all required software, hardware, and communication to the NLS; or a request for a software contractor to provide two main support functions, software design and development, and LAN installation. In either case, the software vendor will conduct an analysis early in the design stage and recommend hardware and communications architectures. Additionally, in the second case they will provide a list of hardware, software, and firmware, by vendor and model, to be procured by the NLS directly. This task must be completed by the software vendor in time for procurement of all items by the NLS, considering at least a six-month lead time.

Once the RFP is issued, a pre-bidders conference should be conducted. The purpose of the conference will be to provide perspective bidders with some background information leading to the issuance of the RFP. NLS will also emphasize those requirements that are considered especially important. The conference will also allow NLS the opportunity to answer any questions the potential bidders may have. The RFP should include directions for submitting questions prior to the pre-bidders conference. NLS may wish to consider establishing a reading room to allow potential bidders to view applicable documentation instead of providing all documentation to all parties requesting the RFP. Limited documentation could, however, be disseminated with the RFP as attachments.

In preparing the RFP document, the NLS should take into account the general considerations that apply to any LOC procurement in addition to some keys points directly related to software development. The RFP should emphasize what the difference is between modifications versus upgrades for software packages, e.g., upgrades could be defined as improvements which relate to operating performance, but do not change the basic function (this type of revision is usually at no cost to the client). Any expected warranties should be clearly defined, e.g. six months free maintenance, and include telephone and on-site technical support services. Particular attention should be given to how the source code will be stored and protected, e.g. stored with an independent agent, which ensures control and protection of the source code in the event that the contractor, for any reason, ceases to conduct business. All copyrights of the product should be under the control of NLS. At a minimum, all efforts performed and all deliverables submitted should meet the standards issued by the American National Standards Institute unless specially waived by the NLS. Any recommended approach or methodology proposed by the bidder should be accompanied by the reference of an established standard, or provide examples or references where the proposed process has been tested and accepted.

Particular attention should be given to how the prime contractor will coordinate with any proposed subcontractor(s) and how responsibilities will be delegated between the parties. Situations wherein the subcontractor is performing the majority of the critical functions may indicate that the prime contractor is not technically qualified to monitor/control the subcontractor. Also, if the prime contractor is utilizing the resources of multiple subcontractors, scheduling becomes a major issue. Any slippage in the schedule could create major problems, especially if the schedule provides for very little flexibility.

NLS may wish to consider including the requirement in the procurement package that the successful bidder obtain a performance bond, at the cost of the government, prior to the start of the contract. The performance bond will need to cover the entire period of performance for the total amount quoted for the effort.

3.4 ADP SYSTEM DESIGN, DEVELOPMENT AND OPERATION

This section presents the three-phase approach to obtaining an ADP system for the braille centers. The three phases are those defined by the classical life-cycle approach: Design, Develop and Operate. The Design Phase and the Development Phase are each further refined into stages (Reference Exhibit 3-2). The Design Phase includes a definition stage and a design stage. The Development Phase includes stages for programming the system and for testing the completed programs. The Operational Phase addresses the system conversion and rollover to include populating the data files/bases, performing routine operations, evaluating system performance, and implementing system changes or modifications.

Exhibit 3-2
ADP Life Cycle

DESIGN PHASE		DEVELOPMENT PHASE		OPERATIONAL PHASE
Definition Stage	**Design Stage**	**Programming Stage**	**Test Stage**	
Management Plan	System Design	Software Development		Rollover
Standards & Procedures	Database Design	Implementation Plan		Routine Operations
Hardware & Software	Input & Output Design	Rollover Plan		System Performance
	File Design		Test Analysis	System Changes

The effort for system design and development involves reviewing the requirements analysis and preliminary design completed at the time of the support contract award, determining the additional data that is required, gathering this additional information, recommending practical solutions based on the information gathered, and developing an operational system. The development phase will also result in establishing a test environment for assessing the standards, methods, and procedures that will be adhered to for the development effort, as well as potentially by all future NLS ADP development efforts.

The technical approach that should be taken will be based on well-defined tasks through which the existing specifications and future requirements will be refined into successive levels of detail, and translated into application software code. The approach ensures a continuity of effort and application knowledge -- each task results in one or more deliverables that serve as inputs to succeeding tasks. The methodology and CASE tools to be used can either be decided upon by NLS, or proposed by the software support contractor. The degree of complexity, documentation, and type of products required within the software development life cycle may vary depending upon the type of system.

The following deliverables are anticipated documentation requirements to be levied on the software support contractor:

- Monthly Progress Reports
- Management Plan
- Software Packages and Hardware Recommendations Report
- Draft Standards Document
- Draft Design Document
- Design Phase Report/Final Design Document
- System Descriptions and Capabilities Pamphlets
- System/Program Specifications
- Modification Plan
- Test Plan
- Implementation Plan
    - Equipment Installation Plan
    - Training Plan
    - Conversion Plan
- Test Analysis Report

- Training Materials
- Rollover Plan
- System Administrator's/Database Administrator's Manual
- Users Manual
- Operations Manual
- Updated Standards, Design, and Specifications Documents

In general, draft and final versions of each document should be required. For the design, standards, and specifications documents there should also be a final delivery of updated documentation once the system has been fully tested and is ready to become operational. This latter documentation will reflect the system "as built", vice "as designed".

3.4.1 DESIGN PHASE - DEFINITION STAGE

During the Design Phase, the ADP system for the centralized braille distribution operation will be designed, whereby the specifications provided to the software support contractor will be more fully developed and detailed, and be reflected in documentation to be reviewed and approved by NLS. The Definition Stage of the design process will involve developing a management plan that will address all facets of the project through the end of the operational phase. The Definition Stage will also include the specification of the procedures and standards that will guide the entire effort.

3.4.1.1 Project Initiation and Orientation

The very first task that should be accomplished during the Definition Stage, once the ADP support contract procurement is awarded, is the Project Initiation and Orientation Task with the successful software support contractor. The purpose of this task is to review the objectives of the effort, establish lines of communication, summarize design details, and finalize a detailed project plan with final schedules for all milestones, tasks, and deliverables. Development of a full understanding and agreement with the NLS concerning the scope of the software solution is the key objective of this assignment, and this understanding will drive the schedule and task details for subsequent activities. The initial scope of the effort to be undertaken and the design methodology to be employed by the software support contractor should be reviewed with the User Review Board at this initial meeting to ensure that all parties have a clear understanding of the products and capabilities that will be available once the ADP system becomes operational. The following inputs should be provided by the NLS to the software support contractor at the initial meeting, if not already provided:

- All existing documentation for the system to be developed and any software documentation for existing systems with which the central ADP systems will interface.

- Any existing NLS standards that are to be followed for data names, screens, reports, documentation, progress reporting, management, etc.

- List of User Review Board members, their telephone numbers, and their roles and responsibilities for the project.

The User Review Board, headed by the COTR, will be the primary point of contact for the ADP contractor. The COTR will be the single source of direction, and will ensure that requirements and comments being expressed by the URB throughout the design process are clearly communicated to the support contractor. If consensus of the URB cannot be attained for some issues, the COTR will need to make the final decision so that design and development can proceed.

3.4.1.2 Management Plan

As a result of URB meetings, discussions with users and NLS, and review of NLS provided documentation, the support contractor should produce a Project Management Plan that delineates the input, processing, and output functionality of the system to be developed. This will be a high-level document that conveys the contractors' approach and understanding of the effort. This document will continue to be detailed and refined throughout the design process. However, it is imperative that all parties have a clear understanding of the scope of the effort, especially if the support contractor is required to provide some type of software maintenance on a warranty basis.

The Management Plan developed will plot the course of the project through all three phases. During this task of the definition stage, project teams (i.e. design team, installation team, conversion team, training team, etc.) will be defined and responsibilities will be established. Documentation formats and reporting requirements will also be determined during this task.

Milestones will be established in the Management Plan taking into account Critical Success Factors (CSFs). These factors represent the key areas where "things must go right" in order for NLS goals for the centralized braille system to be attained.

The Management Plan should define dates for all milestones, itemize tasks, and specify deliverables. The plan should also include an outline for each deliverable document. Additionally, the Management Plan should include a list and schedule of all Government Furnished Equipment (GFE) and Services.

The Management Plan will specify the format for Status Reports that include the tasks, milestones, percent complete, comments and a timeline. There will also be a Project Cost Report included which compares/tracks budgeted costs to actual costs by phase and stage.

3.4.1.3 ADP Standards and Procedures

Before the system is designed, standards must be specified in order to establish the guidelines, limitations and constraints that will control system design and development.

Initially, standards will be established and documented in a draft Standards Document which contains the hardware, software, and database environment standards; design documentation standards for system flowcharts, inputs, processing, and outputs; standards for logic flowcharts and structure charts, screen layouts, error messages, error handling, and table structures; and data administration and naming standards for data entities, elements, attributes, definitions, abbreviations, and acronyms. This document must be completed before any detailed design takes place. The software support contractor should validate the standards through development of the system, providing revisions for the standards and documenting "lessons learned". The revised standards should then be used for any enhancements to the ADP system, and could also be used by NLS as a baseline for the design and development of future NLS ADP systems.

All reference manuals to be used by programmers, user personnel and computer hardware operators will also be identified. The types of manuals required to be produced during the software development effort will be outlined and will include descriptions of the principal content of each document. These documents will be prepared during the Development Phase.

3.4.1.4 Hardware and Software

Regardless of the decision made concerning the extent of the procurement package as it relates to the system hardware, the software support contractor should be tasked to assist NLS in the identification, evaluation, and selection of hardware and software ("off the shelf") packages to be used for the centralized ADP system. This assistance should include identification of the criteria to be used in the evaluation, and the application of those criteria against the candidate hardware and software. It is currently envisioned that NLS will purchase the hardware and off-the-shelf software directly.

The functions to be performed by computer hardware, rather than by computer software or by people, will be defined. Special functions unique to the centralized braille application will be described in detailed (i.e., DPA-IVR, LAN operations, Batch transfers, etc.). This process will define the functions that the hardware must be able to perform in order to be considered for use in the centralized braille system. These definitions will establish the basic structure from which the hardware specifications and/or procurement documents will be produced. These definitions will also be the initial input for composing hardware test criteria.

The specifications will depict performance and costs factors that will be considered in the procurement. A vendor evaluation matrix will be developed that details performance and costs. Performance measures will detail how well the system should perform its functions in quantitative terms. Performance would include the growth potential of the equipment, such as; does it have reserve power, is there add-on capability, and is it compatible for upward conversion. Factors such as memory size, central processor speed, and idle time waiting for input and output should be included. Support services would be evaluated on maintenance, backup and response to problems; systems support; and, type of training available. Cost factors should include price and should also consider the types of acquisition available, i.e. purchase, lease, etc., and what method would be the best.

Since computer hardware is a long lead-time item, it will be necessary to identify specific computer hardware requirements and initiate procurement of critical equipment early in the Design Phase.

3.4.2 DESIGN PHASE - DESIGN STAGE

The Design Stage will include formulation of the system design, the input design (user interface), the output design and the file design. This stage will use previous project documentation, i.e. specifications, flowcharts, standards, etc., as a baseline for further refinement.

3.4.2.1 System Design

The purpose of this task is to complete the detailed design of the ADP system. The software support contractor should conduct interviews and design walk-throughs with the URB to gather additional data, verify the priority of functions and project objectives, and identify samples of outputs to be generated by the system.

The URB information and other data sources will be converted into high-level system flowcharts that allocate functions among people, computer software, and computer hardware. These will then be expanded in scope and detail until all the functions the system must perform are evident. The expanded flowcharts will identify the inputs, outputs, and files that are to be accessed and processed by the software. Interfaces between the centralized braille system and other computer systems and equipment will be defined by specifying the data that must be made available to, or accessed from, other systems, e.g., Regional Libraries, CMLS, etc.

Requirements for interfacing people with the computer system will be described. Human interfaces would include preparing and using source documents, operation of equipment, writing computer programs and other input- and output-related activities.

The specific functions of the computer software will be defined, and design requirements for external system inputs will be established. In addition, input frequencies, quantities, and data sources will be specified for all system inputs. Similarly, the design requirements for the system outputs will be established; report frequency, size, quantity, and number of copies will be stated. Control requirements will include input preparation, input acceptance and processing components. The interfaces that need to be established will also be defined (i.e. DPA-IVR to Primary, CMLS to Primary, Regional Libraries to Primary, Secondary to Primary). Basic system administration functions should be designed to facilitate maintenance of system security, validation tables, menus, and on-line Help.

The relationships between data elements, functions to be performed, and techniques for file organization will be studied in detail so that the most efficient database design can be achieved. The storage requirements for all the data elements which the computer program utilizes will be calculated, taking into account the size and quantity of the records to be stored and the methods of file organization and access. The interfaces between the system database and other databases will be identified by specifying the data that must flow between them.

The computer software modules will share a common system database. However, they will have their own output, input, and processing requirements, which must be specified for each. Hardware and software (e.g. DPA-IVR, adaptive devices, etc.) requirements for the modules will also be identified. As necessary, additional expanded system flowcharts will be prepared at the computer software module or program level. Narratives, equations, algorithms, and decision tables will be developed as aides in defining the functions of the programs. Control requirements will be extended to the modules.

Requirements will be established for the tests necessary to verify the performance of the entire computer-based system. This will be accomplished in conjunction with the activities associated with the overall system design. NLS should be responsible for providing the "real world" test data for populating the test database and for simulating the databases with which the test database should interface. Requirements will be determined for the tests to verify the performance of the major computer software modules.

Database Design

The database design approach should incorporate data modeling using a basic data-driven approach where applicable. Existing system design information will be updated and validated by reviewing each data element and by reviewing the logical data models documented in the form of entity-relationship diagrams. For each data element, the definition, size, and required update frequency should be identified or validated. The logical data model can initially be developed by the NLS URB, with review and refinement by the software support contractor; or, the procurement package can include this effort as a task to be provided by the support contractor during the initial stages of the design effort. The URB will need to be available to the contractor for many design sessions in order to develop and refine the logical data model.

The logical data model will then be translated into a physical model. A data dictionary will be a required output of this task. NLS should develop test data to be provided to the support contractor. The data tables will be loaded with the test data and the formatted test data listings will be a required output to be provided to NLS.

The Database Design Document to be developed and provided to NLS should include entity-relationship (ER) diagrams, the logical data model, a description of each table, expected volumes of data for each entity class (may need to be provided by NLS), and a data dictionary. The ER diagram should include all entities, relationships, and attributes used in the system. The information about entities, relationships, and attributes should be displayed in the data dictionary. As an appendix or as a separate document, the support contractor should provide a listing of the defined data tables with the test data. The Database Design Document is to be considered a living document which will be revised over the life of the project as more detail for the design is available, and during development as changes for efficiencies are made.

3.4.2.2 Database Management

Contingent upon the type of database structure/program chosen, documentation will be developed that defines the database management system (DBMS). This document will contain an explanation of the functions of the DBMS, what makes up the major components of the DBMS, and how the database will be administered. Diagrams will be included that convey how the major modules are related or connected. Control access levels will also be defined to include levels of security and restrictions.

3.4.2.3 Input Interface Design

Designing the input interface is the process of converting a user-oriented description of the inputs into a programmer-oriented design specification. This process will define the most suitable types of input media, for off-line or on-line devices, and select the best techniques for data capture. Descriptions will be developed defining the different types of input to include manual methods, batch methods, or a combination of both. For example, since the centralized braille system will employ bar code scanning, the input interface design should be reflective of this.

User-friendliness is a paramount consideration when designing the user interface for both data input and database queries. The user-interface will address both the screen design and user interaction. A consistent look and feel across all screens should be maintained, and screen controls (buttons, data entry fields, scroll bars, help, etc.) should work in a consistent manner across the application. Screen controls will be of a simple nature and not overly complex. Where feasible, the design will minimize data entry through the use of reference data from the database management system or look-up tables. This approach will minimize the amount of data integrity problems that may arise as a result of typographical and erroneous user input. Where applicable, application code should be designed to perform data edits and validate any data which is entered manually. The screens should have general help as well as context sensitive help (based on the current field). Consideration should be given to having the HELP subsystem be consistent with the help facilities of Microsoft WINDOWS, since many users will be familiar with this, and be developed utilizing the Help Compiler. However, the content of the help messages should provide assistance to a person who has already been trained on the use of the system, and should not be considered a substitute for training.

Top-level user views for hands-on evaluation by the User Review Board should be considered during the design phase. A design walk-through should be accomplished by selected end-users using the application framework. The software support contractor should generate an application that allows the URB to navigate through the system. The purpose of this demonstration would be to continue User Review Board involvement with the design process, and to identify early on if the user interface is what the user community is expecting. The application should provide a "look and feel" for the users so that they can comment on the interface approach.

3.4.2.4 Output Reports and Display Design

The objective of the Output Reports and Display Design tasks will be to define the format of how system report/output products and screens will look once they are printed or displayed, respectively. The goal will be to convert these designs into detailed descriptions from which the programmer can develop the applicable output products. Screen design will use existing library software screens, e.g., READS, Consortium, etc., as a guide for designing the screen layouts. The detailed description for print-outs, hardcopy or print file, will include print positions to be used for titles, column headings, detail data and totals. Existing NLS report formats will be used as a baseline for design and development. A capability for developing *ad hoc* queries/reports will also be examined during this stage to determine if the function will be designed into the system or, if an off-the-shelf software package, would it supplement the primary software.

3.4.2.5 File Design

During this portion of the design stage, two types of files must be designed: master files and transaction files. The master files will contain relatively permanent data, such as patron name, address, etc. The transaction files will contain data with a limited useful life, for example a Has Now file. The objective of the file design will be to provide effective memory storage and to contribute to the overall efficiency of the computer program.

A file design concept must be documented. Depending on the type of database program selected, e.g., hierarchical or relational, record formats will be designed to define logical and physical models. File access methods will be defined and described to include the sequence in which records will be written and read. The file organization will be described regarding how files will be created, e.g. sequentially, direct, indexed sequential, etc.

3.4.2.6 Design Phase Review

At the end of the Design Phase, a comprehensive Design Phase Report will be produced that addresses all design specifications thus far developed. This document will be considered the blueprint for constructing the centralized braille system. There will be a critical formal review of the Design Phase Report that must culminate in approval signature of the design before the development phase can begin. The URB will be provided the Design Phase Report in advance of the review. Approved changes, identified from the review, will be documented and included in the final Design Phase Report.

3.4.2.7 System Orientation

Once the Design Phase has been completed and the final Design Phase Report has been approved by NLS, the design will be a fixed blueprint from which development will take place. At this point in the transition, all of the "players" who will be directly or indirectly involved must become familiar with the new design. Documentation will be developed, possibly in the form of pamphlets, that explains conceptually what the objectives are, and how the centralized braille program will operate. This document should be user-oriented since different types of information will be more useful to some individuals than to others. It is envisioned that a minimum of three pamphlets should be developed: one oriented toward patrons (in multiple formats), one for the regional libraries, and one for NLS in support of other government agencies, i.e., Congress, State Agencies, etc.

The patron pamphlet should provide an overview and explain the program in an easy to understand format. The document should explain the objectives of the program and provide the patrons with instructions on how they may order books under the new centralized system. The document will also explain the benefits of the program to the patron. Initially, this should reflect the future services to be expected, and the pamphlet should not be mailed prematurely. Time for the development and testing of the system will be minimal compared to the time required to convert all patrons to the new mode of operation. The conversion and rollover efforts will be significant, and some patrons may not be able to utilize the services of the centers for several years.

The pamphlet distributed to the libraries will reiterate the information provided to the patrons in addition to explaining what role the regional libraries will play in the centralized system. The pamphlet will also define what the basic computer requirements are for accessing the new system should the library be planning, or interested in pursuing, a data link with the centralized system. The purpose of this document is to provide the libraries with some insight into the centralized braille operations so they may assist/educate their patrons and state agencies before the system is fully operational.

The pamphlet developed for other government agencies will be a document that explains the centralized braille system in a summary format. The purpose of this document is to provide an overview of the program to include what types of services will be provided to the patron, e.g. DPA-IVR, 1-800 service, etc., and the benefits to be realized from the program. This document is intended to provide general insight, not to totally inform other agencies or other NLS groups of everything involved in the program. NLS personnel that are considered "key" to the development of the program should receive additional management training during the Development Phase.

3.4.3 DEVELOPMENT PHASE - PROGRAMMING STAGE

The Development Phase is comprised of two stages: the Programming Stage and the Test Stage. The main objectives of the Development Phase are to develop and test the program code for the centralized system. The major elements of the Programming Stage are; software program development, the development of the implementation plan, and development of the rollover plan.

3.4.3.1 Computer Software Development

During the Design Phase, the functions to be performed will be identified, the user interface screens will be designed, the system input records will be described, report displays and output will be defined, data tables will be constructed, and the files will be designed. Using these documents, the required software modules and databases will be developed in the programming stage of the Development Phase. The steps involved in this activity include: incorporate the software functions into the module; plan the software to efficiently perform the function; code the software to execute the required process; and test and debug the developed software.

Software functions will be incorporated into the modules by the development of detailed data oriented flowcharts. Flowcharts will be developed for each module, and will be based on the expanded system flowchart created during the Design Phase. These detailed data oriented flowcharts and their narrative will define the function of each module.

In program planning, the logic to be used to solve the problems will be developed. Algorithms and flowcharts will be used as tools for program planning. Decision tables will be developed to document the conditions under which the computer will solve problems. The documents that result from the program planning will be retained and become part of the program documentation.

The writing of the programs will be the actual coding of computer instructions. These instructions will be translated into machine code and follow the logical steps of the program plan.

The test and debugging process will involve: 1) translating the coded programs into a compiled, or machine, language, and 2) testing the translated program with test data. The tests should not only test normal case scenarios but also boundary conditions and special cases as well. If the results are not correct, the program will be debugged and corrected.

A reference book of screens (i.e. user views), edits, validation tables, test data tables, and programs should be assembled for review by the User Review Board and for use during system demonstrations. System administrator functions will need to be developed to facilitate maintenance of system security, validation tables, menus, and on-line Help.

3.4.3.2 Implementation Plan

The implementation plan is a document that describes the process of bringing a system into operational use and turning it over to the user. Implementation activities extend from planning through conversion, from the old method/system to the new. At the beginning of the Development Phase, a preliminary implementation plan should be created to schedule and manage the different activities that must be integrated. The plan will be a dynamic document that is updated during the course of the Development Phase. The major elements of the implementation plan will be the training plan, the equipment installation plan, and the conversion plan.

Training Plan

The purpose of the training plan will be to specify how personnel who are to be associated with the centralized braille system will acquire the knowledge and skills necessary to operate the system. Floor operations, ADP systems, reader advisory, clerical and managerial personnel will be trained using reference manuals as training aids. A training schedule will be coordinated for completion after the centers' contractor(s) have been selected.

The programmer's reference manual developed during the Design Phase should be used for training and system maintenance. This manual will be the most comprehensive of the reference manuals prepared.

Training will be completed in conjunction with the equipment installation and checkout. Reference manuals used to train the office and floor operations personnel will consist of both factory manuals that accompany the equipment, and installation and checkout manuals specifically designed for the centralized braille system. The software system manuals will provide a ready reference to specific duties and step-by-step operating instructions for taking orders, changing reader preferences, etc.

The user's reference manual will be self-contained and explain the centralized braille system in terms of the user's specific needs. This will provide the user with a general overview of the entire system. However, primary emphasis will be on the specific steps to be followed, the results to be expected, and the corrective actions to be taken when such results are not obtained. The training team will be responsible for determining the number of users to be trained, when they will be trained, and how they will be trained.

Installation Plan

The installation plan will address the installation procedures, quality control and operating requirements for all development items. Each item to be installed will have a check list that addresses all areas of concern. The check list will be used to document who performed the installation, who inspected the quality of the installation, and when both of these actions occurred.

Hardware/Software Check-Out

The vendor, or contractor, will check-out the hardware and the software they supply. The implementation team will be responsible for monitoring the vendor or contractor and also performing its own check-out tests, using test programs and data developed to simulate centralized braille operations.

Communication Installation Plan (LAN/WAN/VOICE)

The vendor, or contractor, will be responsible for installation and check-out of the communications hardware and software they supply. The implementation team will be responsible for monitoring the vendor or contractor and also performing its own check-out tests, using test communication programs and test data sets. The formal test plan developed for data communications will also be executed to ensure that all performance specifications are met.

With regards to the LAN/WAN, the plan will include a detailed breakdown of the organization and infrastructure of the centers and supporting/affected agencies (CMLS, regionals, etc.). Definitions and groupings of services, expectations of the service level, quality and security will be described in detail. There should be a deliverable for every task it takes to support/develop the LAN/WAN, and these deliverables will function as proof that the contractor has completed the task as specified. At a minimum, these deliverables should include documentation of network structure, problem-solving practices and network availability reporting. These deliverables will address the basic data communications/LAN, the WAN and communications between centers as separate issues.

Conversion Plan

Conversion is the process of initiating and performing all the physical operations that result in the turnover of the centralized braille system to the users. Activities would include development of new policy and procedures manuals, if procedures have changed as a result of the system design; modification of software with which the new system will interface; modification of established communications architectures in order to integrate the new system's communications requirements, etc.

There are two steps in the conversion process: 1) the creation and implementation of a conversion plan throughout the Development Phase, and 2) the creation of a system rollover plan at the end of the Development Phase, and the implementation of the rollover plan at the beginning of the Operation Phase. This section discusses the conversion plan, to include procedures, programs and files, and its implementation. The rollover plan is also presented, while its implementation is addressed in the Operations Phase. The conversion plan addresses the infrastructure that must be prepared for the new system, while the rollover plan addresses those activities that must be completed to prepare the new system for operations.

Procedures Conversion

Current procedures being used by NLS and the regional libraries will have to be modified to comply with the business rules and procedures that have been established in support of the centralized operations and the supporting ADP system. For example, existing library forms may need to be changed, or may no longer be relevant, due to the design of the ADP system. Also, the centralized braille system will interface with a variety of other systems in a way that may impact the existing procedures of the other ADP systems. Procedures that require changes must be identified and documented prior to completion of the Development Phase, and must be ready for implementation at the start of the Operations Phase. It is imperative that changes be reflected in the training materials, and that the changes also be explained during the training sessions.

Program Conversion

Depending on decisions made during the Design Phase, the centralized braille system may include some software modules that are part of an existing library system. Existing programs must be reevaluated with regards to the new environment (operating system, hardware, etc.) in which they will be functioning. Reprogramming should be considered when the programs are poorly documented, heavily patched, or not efficient. System interfaces with other computer programs (e.g. CMLS, PICS, etc.) must be examined. Programming modifications may be required to enable the centralized braille system to receive data through these interfaces.

File Conversion

The file conversion task will be divided into a sequence of four major activities: 1) collection of file conversion data, 2) error checking and correction of data, 3) conversion of files, and 4) testing of converted files. The centralized braille system file conversion data will be collected from a variety of sources. Data will be received in machine-readable format, hardcopy format, or both depending on the situation. Regardless of how the data is received, all data will be verified and corrected before the information is accepted. Manual intervention associated with this process will be kept to a minimum, however, and accuracy of this input will be the major concern. After the files have been accepted, the conversion team must check the data accuracy and this will be accomplished even if the original data files were screened before the data was entered into the new system. Errors may also have been introduced during conversion. Specifically, patron and book/magazine inventory records will be double-checked to ensure accuracy and compatibility.

3.4.3.3 Rollover Plan

A rollover plan that identifies and schedules all required rollover activities will be completed as part of the Conversion Plan. The rollover plan will specify the methods to be employed to turn the system over to the center contractor(s) and will identify the roles and responsibilities of all organizations involved (NLS, software contractor, hardware contractor, and center operations contractors). The three general methods of rollover can be parallel operations, immediate replacement, or phased. Depending on the design criteria, the rollover plan theoretically could incorporate one or a combination of all three methods. In parallel operations, data will be processed under the old and new method, i.e., the center and the regional libraries maintaining duplicate records initially. This process provides the user maximum flexibility because the user does not have to begin using the new system until they are certain that it is producing acceptable output. However, the new system will perform different functions and produce different output that was not available under the old method.

The phased rollover is a compromise between the parallel operation and the immediate replacement. In phased approaches some functions are performed through the new system (center) while the remainder are processed under the old method. The level of functionality performed by the new system increases as time passes. This process keeps the task of correcting errors to a manageable level.

In some situations, there may be a need for immediate replacement wherein the new system assumes the operation of the old system with no overlap. Because the new mode of operation is so different from the present mode, immediate replacement is the type of rollover recommended. Obviously, this poses the most risk and places great emphasis on the testing and acceptance of the new system. However, if NLS decides to absorb some of the existing systems into the centralized ADP system, then certain parallel operations will be required.

During this rollover process, the initial operating schedule will be prepared. The purpose of this document will be to demonstrate how the centralized braille system will perform its functions in a timely manner in the "real world".

3.4.4 DEVELOPMENT PHASE - TEST STAGE

3.4.4.1 Testing

The implementation of the centralized braille system requires that test data sets be prepared and that the system and its elements be tested in a planned and structured manner. Until the system is fully designed, what will be tested and how it will be tested cannot be accurately determined and described, although it certainly can be said that the computer software and the system interfaces will be the focus of the tests.

A formal test plan should be developed that describes the types of tests to be performed and the criteria to be used in evaluating the test results. Test data should be generated and included as an addendum to the test plan. Expected test results should also be documented, to be compared with the actual test results at the end of the Development Phase.

Depending on the type of system and programming software selected during the Design Phase, one of two methods of computer program testing will be used, either the "bottom-up" or the "top-down" method. The "bottom-up" method will be to develop a hierarchical structure under which the software programs are first tested individually and then combined and tested as higher level modules or routines. The "top-down" approach will be compatible with the life-cycle methodology, wherein testing will begin with the general description of the system and be expanded into successively greater levels of detail. In either approach, tests will be designed for each software function for expected inputs, processing, and outputs; integrating these software components; "string" testing system capabilities; and, finally, selecting a subset of the string tests for a stress test with multiple users simultaneously on the system.

The programs that constitute the software system will be subjected to four distinct sets of tests, each having its own set of objectives and criteria. These are program testing, program integration testing, system testing and acceptance/installation testing. Each developer should be responsible for testing his/her own program, and this "unit level testing" should include expected and non-expected inputs at the field level. Program tests are performed after each program is completed to assure that the code satisfies the design specification. The developer should document the results of this testing in a unit test folder. Integration testing is directed toward groups of completed programs, usually satisfying a particular process or function, and these groups of programs generally are known as modules, e.g. an order filling module. The objective of integration testing is to ensure the integrity of each process in the system design. After integration testing, system testing will be performed.

System testing involves tests of the complete system, including interfaces to other systems, to demonstrate that the system satisfies all requirements. The system testing will include all interfaces to external devices and communications equipment, e.g. bar code scanners, DPA-IVR, modem dial-in, tape back-up devices, CD-ROM drives, etc. Detailed testing will be accomplished on the WAN, including data transmission between the centers and communication between the primary and subsystems. The final system tests will be performed after the module tests have been completed. The purpose of the tests will be to exercise the entire system under "live" conditions. The main objective of the system test will be to operate the system under all foreseeable operating conditions. The users (NLS) will specify and conduct these tests. When the user is involved appropriately in the system level tests, progress will be made towards two supplemental goals: user training and user acceptance. If sufficiently thorough, the final system test may serve as the acceptance test.

If the system test is not also to be the acceptance test, the NLS should perform acceptance testing of the system per the formal approved NLS Test Plan that was developed early in the Development Phase. Acceptance and installation tests would be performed before acceptance of the system. Acceptance testing will first be performed at the development site. The software contractor should first demonstrate the system to the NLS designated audience and should then summarize the demonstration results and document specific modification requests to the data dictionary, forms, programs, and outputs (i.e. Modification Plan). A list of any modification requests that are beyond the established design scope should be prioritized by NLS and a decision made as to whether the modifications should be made immediately, or be held until the system has been operational for some period of time (TBD). If modifications are to be made immediately, the test steps previously outlined will need to be repeated.

Once the initial acceptance test has been completed and any required modifications have been completed and tested, the system will be installed at the operational site. Installation testing needs to be performed at the operational site to ensure that all test results obtained at the development site are duplicated. The installation tests will also include any additional testing not performed previously, such as dial-in access to the center. The software support contractor should install the system hardware and software at the NLS designated site, unless a separate procurement for another hardware and software suite to be placed at the operational sites was executed. If so, the developed software will need to be ported to the operational site hardware platform. The support contractor should proceed to demonstrate each input, processing, and output feature of the system, per the test plan and using a wide screen or projection device so that a large audience can view operations. The support contractor should record the feedback from the audience and present a summary of changes, modification requests, and new features desired at the close of the demonstration. Design documents and program specifications should be updated as appropriate. Training Material should be finalized and delivered with the system. Training material development should be accomplished by the support contractor, with testing as to adequacy by members of the company with no experience with the system, prior to delivery to NLS. Training should be conducted for those NLS specified individuals that are responsible for the acceptance testing.

Following successful installation and testing, the URB should conduct more in-depth user acceptance testing. This more extensive acceptance testing period will undoubtedly result in requested modifications or enhancements that were not originally described in the scope of the effort. These enhancements should be considered by NLS for future development, and should be prioritized by the URB to be implemented as funding allows. It is suggested that enhancements not be accomplished immediately unless they are critical. The centers' users, libraries, and patrons should be given the opportunity to use the system for some period of time before changes are made that will affect their interface with the system.

3.4.4.2 Test Plan Contents

The test plan document will contain, at a minimum, three basic sections: Scope, Data Collection and Evaluation, and Special Procedures. The Scope portion will contain the name or number of the test, the specific objectives of the test to include the computer software modules involved in the test, where the test will be performed, when the test will be performed, who will be involved in the test and their specific duties, and a general overview of the test input, events, and anticipated results. Data Collection and Evaluation will consist of a detailed description of the test data sets to be used in the test, a description of the data to be obtained from testing as test results, how the data is to be recorded (e.g., listings, test file), and how the test results are to be analyzed. Special Procedures will explain what procedures are unique to the test, e.g., equipment operating procedures, operator intervention procedures, etc.

3.4.4.3 Test Report Analysis

At the conclusion of each test, a written report will be prepared to record the results; a standardized test report document will be developed and include, as a minimum, a scope and description of the results. The scope will define the name of the corresponding test plan, the purpose of the corresponding test plan and identification of the corresponding test plan and other pertinent documents, such as previous test results. This description of the results will include, as a minimum, how the test was performed, identification of specific test accomplishments, discussion of problems encountered and specific actions to be taken, e.g., accept test results, perform additional tests, etc.

3.4.5 OPERATIONAL PHASE

In the Operational Phase, the system designed and developed in the preceding phases will enter operational use and will be maintained on an on-going basis. Early on in this process, an evaluation of system performance will be made based on predetermined measurements of performance to determine whether the specific functionalities required of the system have been achieved. This phase will involve the actual system rollover, running of routine operations, system performance evaluation and system changes.

3.4.5.1 Rollover

The primary rollover task that must be accomplished prior to the system becoming fully operational is the loading or population of the databases with patron data and inventory title data; title data will be converted first, then patron data. Data will be downloaded from CMLS for the initial load of the patron information; however, the download will not include any information regarding the patron preferences (subject reading preferences, service preferences, etc.), nor will it include HAS HAD information. It is envisioned that as regional libraries transfer their books to the centers, the patrons serviced by those regional libraries will become the responsibility of the centers and the regional libraries will provide the HAS HAD information at this time, either in an automated fashion or in hardcopy. Regional HAS NOW data will become HAS HAD data at the center. Each of the affected patrons will be notified, preferably by phone, that the services of the center are available to them and the procedures for accessing these services. The same phone call will be the mechanism for collecting the additional patron data that are required for the ADP system and for the services to be provided. A data entry screen should be designed and developed for this data collection effort.

Only those data elements required from the patron need to be collected. The data entry screen should allow rapid data collection during the time of the phone call. The person surveying the patron should enter all data as provided and then confirm the data on the screen with the patron prior to ending the phone call and updating the database. The number of people to be assigned the surveying responsibility will be based on how soon the services need to be provided by the center vice the regional library (all books have been transferred), and how many patrons need to be contacted that are associated with that regional library.

It is assumed that all patron data will be downloaded from CMLS at one time for the initial database load soon after the system has been installed and fully tested. RLs will be responsible for reviewing and correcting the CMLS data before the initial download, and again just before each RL is rolled over into the centralized service. Once books become available (which would be towards the end of the set-up operations phase), circulation to patrons could begin if their name and address are in the center's ADP system from CMLS. The only service that cannot be provided until the surveys are complete, and the HAS HAD information has been received from the regional library for their patrons, is the Profile Select.

The book title information from PICS, BLND, and MSCs (READS) will be downloaded for the initial population of the center's ADP system. The database should be populated with this information prior to the books being shipped to the centers. As books are received at the centers, the bar code labels will be applied and scanned, title ID and volume number will be key entered, and the information will be transmitted to the primary system and will be matched to the title inventory for validation. If a match is not found, then the book will be placed in a "not available" status until the title can be confirmed and if found it becomes immediately available for circulation. If the title information is not available at the time that the first books are received, the books will be placed in the "not available" status.

It is understood that all known titles, as recorded in the other existing systems, will reside in the primary center's database even though no inventory of those titles may have yet been received from any regional library or MSC. In this case, the number of copies for the title in the centers' inventory will be zero.

3.4.5.2 Routine Operations

During the routine operations stage, the centers' contractor(s) will have completed training and will be conducting normal order filling/shipping/stocking operations. The data processing operation will be evaluated by the level of service provided to its users. The rules under which the operator, programmer and other personnel work will be defined as standards, and these standards will be the reference against which performance will be measured. The standards document will contain explanations on standards policy, administrative standards, operating standards and programming standards.

3.4.5.3 System Performance

Timeliness will be a key factor in maintaining an acceptable level of service, and will be evaluated based on response time, throughput time, and turnaround time. Response time will be defined as the time that elapses between the release of input data by the user and the receipt of the computer output. Throughput time will be the time required for work to flow through the computer room, and will depend on the efficiency of the computer program, the computer equipment, the operating system, and the operator. The turnaround time will represent the throughput time plus the time required for the jobs to pass through input and output control operations.

3.4.5.4 System Changes

Recommended changes or modifications, once the system has been fully tried and tested, will be well documented and reviewed by a modification team established by NLS. Each documented change will be produced using a standard report format, which will ensure that no one change receives approval or higher priority simply based on its presentation or appearance. Once changes have been reviewed and screened, they will be prioritized based on degree of importance in meetings goals, standards and objectives documented earlier in the process. Once prioritization is complete, changes will be evaluated against external limitations, e.g., budget constraints, staff limitations, and the status of other NLS projects not related to the centralized braille services project. Based on the results of this analysis, approved changes will be re-prioritized and scheduled for implementation. All parties affected by the change will be notified well in advance of the change becoming operational.

SECTION 4

PROCURE FACILITIES, SHELVING AND EQUIPMENT

Section 4

PROCURE FACILITIES, SHELVING AND EQUIPMENT

This section of the report presents issues and recommendations pertinent to the procurement of facilities, shelving, and other non-ADP equipment that will be required to successfully transition from the present mode of service to the proposed centralized services.

4.1 PROCURE FACILITIES

Two separate facilities must be obtained through purchase or lease to the NLS to support the proposed braille center operations. The specifications for these facilities are contained in Section 4 of the Study I, Part 2, Specifications report, and are not repeated herein. These facility specifications must be satisfied in order to successfully implement the centralized operations. A discussion of the recommended steps to be taken, and considerations relevant to the facilities procurements and set-up, are contained in this subsection of the report.

4.1.1 Make Purchase/Lease and Build-to-Order/Retrofit Decisions

Two decisions and/or considerations must be made prior to the development and issue of the RFP(s) for the provision of the specified braille center facilities. These decisions and considerations include whether the facilities are to be purchased or leased, and whether the facilities are to be new, built-to-order structures or retrofitted existing structures. Considerations applicable to each of the four possible combinations resulting from these two sets of options are presented below.

Purchase and Build-to-Order - Having the facilities built-to-order, i.e. per the layout drawings contained in the specifications, is optimal from the standpoint of maximizing the efficiency of the proposed operations at the centers, including the structural integration of the mobile shelving rails and the floors. Purchase of the facilities would, however, require a larger up-front commitment and capital investment than would leasing. But ownership of the facilities would afford NLS more control over repairs, maintenance, and improvements to the facilities than would leasing, and would be less expensive in the long-term (i.e. the present value of lease payments discounted over the life of the asset would exceed the initial capital outlays to purchase the same asset). However, NLS has expressed some reservations as to whether it (i.e. NLS) would be permitted to purchase the subject facilities, regardless of the economics of the situation, simply due to either annual funding constraints, and/or due to political constraints (i.e. it may not be "allowed" to purchase facilities regardless of any inherent logic for doing so).

Lease and Build-to-Order - If the facilities cannot be purchased, it might still be possible for NLS to either negotiate with a commercial real estate development firm(s), or possibly with the GSA, to have the facilities built-to-order and then leased back to the NLS. This option would provide the benefits of optimal facility layout without the necessity for legal ownership. However, both because the mobile shelving would be an integral part of the structure in a build-to-order scenario (i.e. the track rails would be installed in the concrete floor when it is poured), and because of the size of the required investment on the part of the lessor (be it a commercial firm or the GSA), the lease would certainly have to be long-term (10 years minimum, probably longer), from NLS's and the firms'/GSA's perspective, respectively.

Purchase and Retrofit - If the facilities can neither be built-to-order and purchased, nor built-to-order and leased, another option would be to purchase and retrofit existing facilities. The result would not be optimal layout configurations, but might suffice depending upon both the existing facilities' characteristics and the extent of the modifications necessary in the retrofits. One disadvantage of this option is that the mobile shelving rails could not be structurally integrated with the floors of the facilities as in the build-to-order scenarios, but the lead time from contract award to completion of facility set-up would in all likelihood be less than that for built-to-order facilities.

Lease and Retrofit - In this option, the same considerations that are true for the Purchase and Retrofit scenario apply, but the facilities would be leased rather than purchased. This is probably the least desirable scenario from the perspective of the NLS considering both control over the facilities and the cost of the assets over their estimated useful lives, and additionally if the mobile shelving is also owned by the NLS. However, if the mobile shelving requirements were to also be leased along with the facilities (possible, but unlikely), this would be a more desirable arrangement than leasing the retrofitted facilities with installed shelving that is owned by the NLS (even if the rails are not poured in the floors, because subsequent relocating of the shelving to other facilities in the future would be a significant and expensive endeavor).

4.1.2 Develop RFP for Facilities

The first step in the development of the RFPs for the two center facilities should be the decision as to which of the four options described in Subsection 4.1.1 are feasible as the basis for the facility procurements. ManTech recommends that the facilities be purchased and built-to-order, but another single option, or options, could be the basis for the RFPs as dictated by fiscal constraints on one-time capital expenditures, or possibly for other reasons. From an operational perspective (the maximization of both production efficiency and effectiveness), the facilities should be built-to-order and not retrofitted, and from a financial perspective (i.e. the minimization of facility space cost over the long-term investment), the facilities should be purchased. However, other factors may overrule these considerations in the decision process.

Whichever of the four options (one or several could be "bundled" in a single RFP, with the offerors asked to submit proposals and bids for each option), the NLS will have to make the necessary modifications, if any, to the facility specifications developed by ManTech resulting from any non-participation of network braille libraries, and resulting from the East versus West primary center location decision. Non-participation by libraries will reduce the required facility storage space as documented in the specifications, and a decision to locate the primary center in Cincinnati will result in a change to the office space requirements in both centers (they will be reversed) as documented in the specifications. With these adjustments having been made, the RFP should be formulated with modified specifications.

Whatever the procurement basis for the facility RFPs, architectural drawings will be required whether the structure is built-to-order or retrofitted. The facility RFPs should be written so that the offeror (general contractor or lessor) is required to provide the drawings as part of the procurement. Alternatively, NLS could separately contract the architectural drawings out to an A/E firm after selection of the facilities contractors, in the case of built-to-order facilities (drawings should be provided by the offerors in the case of retrofitted facilities).

The integration of mobile shelving into the facility design, whether built-to-order or retrofitted, will be a fundamental part of the architectural design of the construction or retrofit, respectively. The specifications, including the layout drawings in the case of built-to-order structures, will be the basis for the architectural drawings. In the case of retrofitted facilities, the "intent" of the layout drawings and other facility specifications, together with drawings of the existing structures, will form the basis of the drawings for the centers.

If the facilities are existing structures and are to be leased, the lease should be constructed in such a manner that the owner of the property is first required to make the required improvements to his/her property in order to satisfy the specifications. Alternatively, NLS could lease an existing structure as-is and subsequently undertake the required improvements either through managing the work itself, or through a general contractor, with some leasehold improvements of a general nature possibly acting as offsets to the rent. ManTech strongly recommends the former, i.e. that NLS require the landlord to provide the facilities per the specifications, and not undertake any leasehold improvements itself, even under professional management, until subsequent to the startup of operations and the realization that some additional, unforeseen improvements are absolutely necessary.

4.1.3 Issue RFP for Facilities and Select Contractors

With the facility RFPs formulated taking into account both the above specific considerations, and the general considerations that apply to any LOC procurements, the RFPs should be issued and the facilities contractors selected for both the Eastern and Western Centers. Although it is possible that a single firm, or entity, may offer to provide both facilities, it is unlikely. The NLS will, in all likelihood, enter into separate contracts with separate firms/entities in the contemplated procurements (with the GSA option being a possible exception).

In the case of built-to-order facilities (whether purchased or leased), the specifications will be actual design requirements for the facility contractors, whereas in the case of retrofitted facilities, the "closeness" with which offerors propose they can meet the specifications (and the optimal facility layouts as shown in the specifications) should be the technical evaluation criteria. Cost will also, of course, be an important evaluation criteria as well. The NLS must decide any specific weightings for technical and financial evaluation criteria in this procurement, and ManTech makes no recommendations in this regard. Based upon the responsiveness of the proposals and bids received from prospective facilities contractors, and taking all relevant technical and financial criteria into consideration, the NLS must then select the facilities contractors and make contract award to begin the construction of built-to-order facilities, or the retrofit of existing facilities.

It is further noted that if the facilities are to be built-to-order, it is necessary to either time the procurement of the mobile shelving so that information on shelving specifics can be provided to the general contractors constructing the facilities, or to attempt to combine the procurements and solicit both the facilities and shelving from contractors that team in one manner or another. The mobile shelving envelope, column spacing, electrical power supply, lighting, floor loading and rail installation must be closely integrated with construction in this case (and with existing building design, if installed in a retrofitted facility).

4.[illegible]4 Set-up Facilities

The set-up of facilities includes any new construction or retrofit activities that will be required to meet the facility specifications and provide the resources as documented by ManTech, and as modified by NLS based upon anticipated network library participation and the East versus West primary center location decision. The period of time required to complete construction or retrofit may vary considerably based upon a number of factors. Depending upon NLS's decision regarding build-to-order versus lease of facilities, and/or possibly packaging the facility and shelving procurements together, the facility set-up phase (from the perspective of the facility contractors) may be considered to end at one of two times in the implementation process:(1) when a Certificate of Occupancy has been obtained (from the local Building Commission upon inspection of the premises and following correction of all indicated violations by the lessor/general contractor), with shelving already fully installed (i.e. the shelving contractor is not considered the first occupant); or (2) when a Certificate of Occupancy has been obtained, but the shelving is to be subsequently installed by a party other than the facility contractor, i.e. a separate shelving contractor, who is solely responsible for the shelving installation in the facilities, is not teamed with the facilities contractors in any way, and is considered the first occupant.

4.2 PROCURE MOBILE SHELVING

Mobile shelving must be obtained through purchase or lease to the NLS to support the proposed braille center operations. The specifications for this shelving are contained in Section 4 of the Study I, Part 2, Specifications report, and are not repeated herein. These shelving specifications must be satisfied in order to successfully implement the centralized operations. A discussion of the recommended steps to be taken, and considerations relevant to the shelving procurements, are contained in this subsection of the report.

4.2.1 Make Packaging, Purchase/Lease and Power Decisions

Three decisions and/or considerations must be made prior to the development and issue of the RFP(s) for the provision of the specified braille center mobile shelving requirements. These decisions/considerations are whether the shelving is to be purchased or leased, whether the shelving procurements should be "packaged" along with the facility procurements, and whether the shelving should be electrically or manually powered. These issues are discussed below.

Purchase/Lease Decision- Although it may be possible for the required shelving to be leased and installed in a (new or retrofitted, owned or leased) building, in all probability the shelving would have to be purchased and installed. The shelving would certainly be purchased in the build-to-order and buy scenario from a physical perspective, since the rails would be installed in the facilities when the floors are poured. Shelving vendors will also generally desire to sell their products, not lease them, although such a leasing arrangement could possibly be arranged with a vendor. Installation of mobile shelving is more involved than conventional shelving, and represents a relatively greater proportion of total cost than the latter. However, one possibility exists whereby the shelving could be leased, albeit indirectly, and this is if the facilities and shelving are packaged into a single procurement and are leased from a contractor; this would undoubtedly require a lease term of 10 years, and probably longer in duration, in order to present an acceptable risk to the contractor for the investment incurred. It is ManTech's recommendation that the shelving be purchased and installed in the facilities per the specifications.

Procurement Packaging- There is the possibility that the facility and shelving procurements could be packaged together; however, the level of responsiveness to such a solicitation is hard to predict. It can be assumed that, in general, there exists a trade-off in reduced total costs versus more "headaches" for NLS if NLS were *not* to package the procurements, i.e. NLS would effectively pay the facilities contractor, or another party/general contractor, to be a "systems integrator" in a packaged procurement of both resources. NLS may, however, realize reduced prices for the combined shelving requirements at both centers in a purchase from the same firm (several vendors in the industry have national coverage) in a single procurement, i.e. a quantity discount buy. If a packaging arrangement were used, the mobile shelving requirement would be split into two procurements, even if supplied by the same shelving vendor in both the eastern and western sites, because the facility teaming partners would be different firms in each of the two locations, thus mandating separate contracts and procurements. It is ManTech's recommendation that there is some merit to soliciting packaged proposals and bids from prospective firms/teaming arrangements for combined facility and mobile shelving requirements, but response to this particular type of solicitation may be meager, and it should be an option in addition to the separate solicitations, and not the fundamental solicitation.

Power Source- The final major decision that NLS must make regarding the shelving is whether it is to be electrically or manually powered. The advantages to powered shelving is that it improves labor productivity and represents the most modern technology in that particular mode of storage, while its disadvantages are that it is more expensive than manual shelving to purchase and operate (in terms of electrical power consumption). It is ManTech's recommendation that the shelving be electrically powered, and it should also be noted that it may not be feasible to manually power the shelving if the specified shelving configuration is employed (a full range will weigh over 50,000 lbs.).

4.2.2 Develop RFPs for Shelving

With the above decisions having been made, the RFPs for the required shelving should be developed using the documented specifications as the basis for the statements of work. ManTech recommends that the shelving be electrically powered, purchased, and procurements solicited in an unpackaged fashion with regard to facilities (with packaging being an option, not mandatory), but another option, or options, could be the basis for the RFP as dictated by fiscal constraints on one-time capital expenditures, or possibly for other reasons. From an operational perspective (the maximization of production efficiency and effectiveness), the shelving should be electrically powered not manually powered, and from a financial perspective (i.e. the minimization of equipment cost over the long-term investment), the shelving should be purchased. However, other factors may overrule these considerations in the decision process.

Whichever option or options are selected (one or several could be "bundled" in a single RFP, with the offerors asked to submit proposals and bids for each option), the NLS will have to make the necessary modifications, if any, to the shelving specifications developed by ManTech resulting from any non-participation of network braille libraries. Non-participation by libraries will reduce the required shelf storage space as documented in the specifications. With the appropriate adjustments having been made, the RFP should be formulated with modified specifications, and with any as-built or as-planned architectural drawings of the center facilities if available at the time of RFP issue. Otherwise, the specification report layout drawings must suffice for shelving bidding purposes, with any future change orders resulting from differences between the two sets of drawings considered on a case-by-case basis.

One additional point to consider is the level of detail to be specified in the RFP statement of work for mobile shelving. The specifications developed by ManTech for shelving contained in the Study I, Part 2, Specifications report were synthesized from a much longer list of requirements, and represent the most important requirements that must be included in an RFP for the required shelving. This tack of not "over-specifying detail" was taken at NLS direction, because of previous experience with procuring mobile shelving, i.e. the NLS found that over-specification of detail will eliminate all, or all but one, potential shelving vendors depending upon the specific details listed as mandatory requirements.

4.2.3 Issue RFP for Shelving and Select Contractors

With the shelving RFPs formulated taking into account both the above specific considerations and the general considerations that apply to any LOC procurements, the RFPs should be issued and the shelving contractors selected for both the Eastern and Western Centers. It is possible that one firm may provide the shelving at both locations, or shelving may be provided by different firms in each location.

The degree to which offerors propose to meet the technical specifications, and their proposed costs, will constitute the evaluation criteria to be considered. The NLS must decide upon any specific weightings for technical and financial evaluation criteria in this procurement, and ManTech makes no recommendations in this regard. Based upon the responsiveness of the proposals and bids from prospective shelving contractors, and taking all relevant criteria into consideration, the NLS must then select the shelving contractors and make contract award to begin the installation of the shelving into any built-to-order facilities, or the installation of the shelving into any retrofitted facilities.

It is reiterated here that if the facilities are to be built-to-order, it is necessary to either time the procurement of the mobile shelving so that information on shelving specifics can be provided to the general contractors constructing the facilities, or to attempt to combine the procurements and solicit both the facilities and shelving from contractors that team in one manner or another. The mobile shelving envelope, column spacing, electrical power supply, lighting, floor loading and rail installation must be closely integrated with construction in this case (and with existing building design, if installed in a retrofitted facility).

4.2.4 Install Shelving

The installation of shelving in the center facilities will include any activities that will be required to meet the shelving specifications and provide the resources and capabilities as documented by ManTech, and as modified by NLS based upon any anticipated network library non-participation. The period of time required to complete shelving installation may vary considerably based upon a number of factors.

Depending upon NLS's decision regarding build-to-order versus lease of facilities, and/or possibly packaging the facility and shelving procurements together, the shelving installation (from the perspective of the shelving contractors) may be considered to begin at one of two times in the implementation process:(1) when construction on a new facility begins, or at least when the floor is poured (i.e. the shelving contractor is not considered an occupant); or (2) after a Certificate of Occupancy has been obtained for the facilities, and the shelving is subsequently installed by the shelving contractors, who are solely responsible for the shelving installation in the facilities, and are considered the first occupants, although not operators.

4.3 PROCURE OTHER NON-ADP EQUIPMENT

In addition to providing the center operators with facilities, shelving, and ADP systems to successfully implement the specified services, the NLS must also provide certain other equipment to both the office and floor operations, which are enumerated in the specifications and are not repeated herein. However, the level of effort associated with decision making prior to these procurements, the generation of RFPs (if any), the evaluation of offers/bids for these items, and the associated costs are incidental relative to the facilities and shelving procurements. The timing of these procurements will be somewhat flexible, as long as such GFE is available to the operators of the centers upon the commencement of the operations set-up phase.

Such non-ADP GFE required for the floor operations will include work tables, pallet jacks, ladder carts, shelf carts, mailing containers, and labeling stock, while general purpose office furniture, microfiche readers, and union catalogs will be required for the office operations (phones, fax machines, and PCs are considered ADP equipment). It may be possible for NLS to provide the facility operators with surplus general office equipment, microfiche readers, and union catalogs rather than going through a buy for these items, simply because the required quantities are very modest. The mailing containers procurement is a process independent of the centers, but containers will be needed at the centers upon the commencement of normal operations. All other floor operations equipment cited above will have to be purchased.

SECTION 5

PROCURE OPERATIONS SERVICES

Section 5

PROCURE OPERATIONS SERVICES

This section of the transition plan report presents issues and recommendations pertinent to the procurement of operations support that will be required to successfully implement the specified centralized braille services.

5.1 DEVELOP RFPs FOR OPERATIONS SERVICES

Contracted services to conduct the proposed braille center operations for both the set-up and normal phases of operations must be obtained by the NLS through a procurement. A discussion of the recommended steps to be taken and considerations relevant to the operations services procurements are contained in this subsection of the report. Discussions of the transition steps to be taken and the issues relevant to both the set-up of operations by the contractors at both centers, and for the conduct of continuing operations, are presented in Sections 6 and 7 of this report, respectively.

The operations specifications contained in the Study I, Part 2, Specifications report will form the basis of the statements of work to be included in the subject RFPs for the centers' operations. However, the NLS will have to make any necessary modifications to the operations specifications developed by ManTech that result from: 1) any non-participation of network braille libraries, 2) the East versus West primary center location decision previously made for the facilities procurements, 3) any participating libraries that choose to retain reader advisor services at their own operations, 4) any changes to the documented operating procedures due to actual ADP systems requirements, or 5) differences between the layouts of actual facilities to be used and those documented in the specifications.

Non-participation by any libraries will reduce the required quantity of labeling of shelf slots in the operations set-up phase as documented in the specifications, and will also reduce the required quantity of collection conversions to be performed in the normal operations phase (but may have little effect upon the patron conversion effort, because these patrons will still be eligible for service from the centers, and will have no impact upon the title conversion effort). A decision to locate the primary center in Cincinnati would also result in a change to the office staffing and workload requirements in both centers as documented in the specifications (they would be reversed). Depending upon the number of libraries that indicate they will retain reader advisory services locally, the reader advisor staffing at the primary center should possibly be reduced, i.e. network libraries would assume some of this workload. Procedural differences (if any) between the documented operational specifications and those mandated by the actual ADP system developed must be incorporated into the revised specifications. Finally, as-built or architectural drawings of the actual facilities to be used should be provided to prospective bidders in the solicitation package. With these adjustments having been made, the RFPs should be formulated with the modified operations specifications as the statements of work.

It is recommended that a single RFP for operations be formulated, with prospective offerors required to specify which of the two centers they propose to operate (it is possible, though highly unlikely, that a single firm/entity will bid to operate both centers, if some type of teaming arrangement is formed between entities located in both locations). It is also recommended that each offeror be required to bid on both the set-up phase of operations and the normal phase of operations, and specify the costs for each phase, and in total, for the term of the contracts. Lastly, it is recommended that the contract term of the operations set-up phase be set at approximately 18 months (which should allow adequate time for all activities to be performed in this phase), and the contract term of the normal operations phase to be set at three years (possibly with yearly, or other, renewal options).

5.2 ISSUE RFPs AND SELECT OPERATIONS CONTRACTORS

With the operations RFPs formulated taking into account both the above specific considerations and the general considerations that apply to any LOC procurements, the RFPs should be issued and the operations contractors selected for both the Eastern and Western Centers. Although it is possible that a single firm, or entity, may offer to provide services at both facilities, it is unlikely. The NLS will, in all likelihood, enter into separate contracts with separate firms/entities in the contemplated procurements.

Based upon the responsiveness of the proposals and bids from prospective operations contractors, and taking all relevant technical and financial criteria into consideration, the NLS must then select the facilities contractors for each site and make contract award to begin the set-up of operations at the centers. The NLS must decide upon any specific weightings for technical and financial evaluation criteria in this procurement, and ManTech makes no recommendations in this regard.

Although ManTech has recommended that the prospective contractors list their bids for the set-up and normal operations phases separately, the same contractor must be selected for both phases at each individual site since the necessary training is to occur during the set-up phase of operations, and not during the normal operations phase. Prior to the actual deployment of operations personnel for the set-up phase of operations, the NLS must review the proposed staffing roster and approve the personnel selection (per the specifications), or inform the operator of any required staffing changes.

SECTION 6

SET UP INITIAL OPERATIONS

Section 6

SET-UP INITIAL OPERATIONS

This section of the transition plan report presents issues and recommendations pertinent to the set-up of initial operations that will be required to successfully implement the specified centralized braille services. The activities in this phase of the implementation cannot commence until Certificates of Occupancy have been obtained for, and all mobile shelving has been installed and tested in, both center facilities, and all ADP systems have been designed, developed, and undergone initial testing.

6.1 PROVIDE ALL GOVERNMENT FURNISHED EQUIPMENT

With both facilities ready for occupancy, all mobile shelving installed and tested, all ADP systems designed, developed, and having successfully completed initial testing in the ADP contractor's facility, and operators selected to run the centers, the set-up phase of operations can commence. The first step that should be taken in this phase is for NLS to ship all remaining required government furnished equipment (GFE) to the two centers.

Although it will be the operators of the two centers who will use and be responsible for any GFE assigned to the centers, at the very outset of this phase the operators will not have as much to do as the ADP systems contractor. Rather, the ADP systems contractor will initially require some, but not all, of the subject GFE to perform installation of the ADP systems and an operational test. Office furniture should be arranged in the configurations that will be used in operations by the operator, and then cabling laid and workstations connected for the operational testing of the ADP systems. Similarly, work tables and shelf carts should be arranged in the receiving/shipping areas by the operators to facilitate the operational test of the ADP systems with regard to all distribution functions. Some (not the entire required inventory) mailing containers will also be necessary to facilitate the ADP operational testing. Finally, if any or all of the required ADP hardware is not to be provided by the ADP systems contractor, but is rather to be specified by the ADP contractor and procured by the NLS directly, this equipment must also be shipped to the centers at the beginning of this phase.

The NLS has three options with regard to managing GFE in this initial part of the set-up operations phase. The first option is to activate the centers' operations contracts and have the operators be responsible for the GFE. The operators could arrange GFE in the centers, establish liaison with the USPS, establish contacts with local suppliers for goods and services, acquire operational supplies, etc, and possibly begin labeling the shelf positions (ref. Section 6.6). The second option is to construct the system installation and operational test part of the ADP systems contract so that the ADP contractor is responsible for all GFE at the centers throughout the short, but discrete, operational test phase. The third option is for NLS to station employees on-site at each of the two centers who would be responsible for the GFE during the relatively brief ADP systems installation and operational test phase.

Mar-Tech recommends that the operators assume full responsibility and custody of GFE in this early stage of set-up, although there is no inherent reason why either of the other two alternatives could not be exercised. All GFE must then be labeled with property tags, and recorded in the GFE inventory records for each center by the operators (with the possible labeling of shelving, with both bar code labels and LOC property labels, commencing at this point as well).

6.2 INSTALL AND TEST ADP SYSTEMS

The second major step to be taken in the set-up phase of operations is the installation and final operational testing of the ADP systems in both centers as described in Section 3 of this report. The ADP systems contractors, subcontractors and/or representatives will install and perform final operational acceptance testing for all ADP hardware, software and peripherals required for the subject operations, including the primary system and two subsystems, CD ROM subsystem, bar code subsystem, LAN with cabling and workstations, telecommunications systems including autoattendant, DPA IVR, answering machine, gateways, modems, fax/modem, links to the CMLS database and network library users via the WAN, and any other required items. If any hardware or software is to be furnished to the ADP systems contractor by NLS at this stage, it should be on-site and available on Day-1 of this activity. When the

ADP systems have been successfully installed and passed final operational testing, the training of the centers' operators vis-a-vis the ADP systems can begin.

6.3 TRAIN PERSONNEL

There will be essentially three types of training required for the operations staff of the braille centers. The first will pertain to the use of the ADP systems and the necessary procedures that must be followed in the distribution and office functions that interface with the ADP systems, which are many, and training for the ADP systems staff regarding all aspects of systems operations and administration functions as well. All center staff will participate in training to some extent, since all will interface with the system to some extent, without exception. This training will be performed by the ADP systems contractor, subcontractor, or representatives on-site at the two centers, as described in Section 3 of this report. The staff will be provided with documentation, direct instruction, and hands-on training by the ADP contractor in order to impart the necessary familiarity with the ADP systems to successfully use and operate the system as documented in the specifications.

The second type of training that must be provided to both centers' operations staff is heavily dependent upon any previous experience the awarded contractors of the centers have with providing braille services and/or other services to the blind and disabled. The NLS must provide all of the contractors' operations staff overall training on blindness issues and the strong customer service orientation that the centers' operations must have, and must provide the reader advisors at the primary center with any necessary training on the NLS braille collections to be managed, and any necessary procedures that should be followed as a course of normal network operations when interfacing with patrons. NLS will not need to develop an elaborate training plan for this activity, as certain NLS staff are quite knowledgeable in these subjects and can develop and execute a curriculum of the subjects fairly easily. To reiterate, the level of effort required in this step is greatly dependent upon the contractor's previous experience.

The third type of training the centers' operations staff must have is familiarity with the mobile shelving, the facilities' operational plants, and the facilities' layouts and safety features. The shelving contractor will train the floor and office (in the event that support is required in floor operations) operations staff in the correct use of the mobile shelving and its safety features, and explain the procedures to follow for obtaining repair and maintenance support from the vendor; however, only floor operations staff will be permitted in the stacks, with any office staff accessing the stacks effectively "transferred" temporarily. All staff at the centers should be given a "cook's tour" type of training on the buildings' physical plants by the owners/lessors, but the managers, lead RA (in the primary center), and lead floor operations personnel in each center should receive more extensive training to enable them to detect problems, or potential problems, in the physical plant, and know the appropriate course of action to follow. Lastly, all operations staff should receive basic training from the facility owner/lessor regarding the layout of the facility, including fire exits and preferred routing upon evacuation, and any other matters pertaining to security, such as the locations of fire extinguishers.

6.4 LABEL SHELF POSITIONS

At this point in the set-up operations phase, and possibly before ADP systems installation is completed (ref. Section 6.2), the operations contractor will perform the step of labeling the mobile and fixed shelving in the stacks, and the forward shelving in the receiving/shipping areas, with bar code labels per the documented specifications. This step could conceivably happen in one of two ways, which is to be determined by the ADP systems designer/developer, and is not specified by ManTech.

The shelves could be labeled with unique locators in an ascending fashion per a given scheme, and a "crosswalk" table used within the software's algorithm to optimize picking sequence. Alternatively, the shelves could be labeled so that the ascending numbering scheme is in optimal (serpentine) picking sequence. In any event, the centers' operators must label the quantity of shelving documented in the specifications, as modified by NLS, and in a sequence and fashion as specified by the ADP systems developer. Whether or not label location information must be explicitly input into the ADP system is a design issue to be determined by the systems developer, and is not specified by ManTech. However, if it is a requirement of the developed system, it must be performed at this juncture in the set-up.

6.5 TITLE INFORMATION CONVERSION

Concurrent with the floor operations staff labeling the shelving in each facility, the RAs and ADP staff in the primary center must undertake the conversion of title data for all books and magazines in existing braille collections as documented in the specifications, and this information will come from several different sources. This conversion of data will consist of electronic transfers of data from the BLND CD-ROM-based database, the PICS system which would be accessed via telecommunications, possibly MSC READS databases which would probably be provided via magnetic tape, and possibly from one, or several, regional braille libraries with "above average quality" BR title data (in terms of both data completeness and accuracy), which would probably be provided via magnetic tape, but could possibly be provided on some other media.

The objective of this task will be no less than to load the primary ADP system database with all relevant data required for the book/magazine title record as designed by the ADP system developer. Although the ADP system will be designed to accept/import data from the PICS, READS, and BLND databases, there will inevitably be some data translation problems, and error checking and/or editing will be necessary to ensure completeness and accuracy of the information.

The ADP staff will take the lead role in the electronic conversion of the data and will follow the procedures as documented in the ADP systems user/operations manual(s), and the RAs will take the lead role in ensuring data integrity by performing cross checks against data for the same titles from other sources (e.g. the union catalog) and performing any modifications to the records per the ADP system user instructions. There should be a moderate requirement for manual data entry in this task, as the sources of most data will be machine readable, albeit in a variety of media and formats. Also, because the ADP system will be designed to import data from the three aforementioned databases, this task will constitute a moderate, not a herculean, effort. The center RAs will coordinate with the NLS regarding the appropriate subject coding (developed by, or for, NLS) for the titles in this step, and this will probably account for the bulk of any manual data entry requirements.

6.6 CONVERT INITIAL COLLECTIONS

It is recommended that the initial braille collections to be converted into the centers' inventories be those of the two MSCs, as specified in the set-up operations specifications. The materials to be converted will include all book collections and back-issue magazines currently contained in the two MSCs, but not the magazine archives. This conversion will take approximately one year, since it consists of approximately 250,000 volumes, which is one-fifth of the total NLS braille collections. It is recommended that the BR collections be converted first, then the special book collections, and then the magazines, although there is no compelling reason that this order must be followed.

The conversion of the MSC collections is recommended initially because they are currently in the custody of the NLS, via the MSCs, and are co-located in the specified geographic locations for the braille centers. Furthermore, this step may help convince any network libraries that are hesitant about participating in the program that the NLS is serious about the concept and is hence converting "its own" collections first. Lastly, the conversion of the MSC collections, which in the case of the BR sets are "back-up" collections, will allow the centers to develop some copies to be circulated before any patrons are to be directly serviced by the centers, i.e. the centers will have some books to circulate *before* they receive orders, not vice versa.

The operators of each center must convert the book and magazine MSC braille collections to be housed in each of the two centers, and follow the conversion procedures as documented in the specifications (as modified by NLS for non-participation of any libraries, and/or by the ADP systems developer for any procedural differences from the existing specifications with regard to collection conversion). It is recommended that patrons who currently have checked out braille books and/or magazines from the MSCs return them to the MSCs rather than the centers themselves, and this is recommended from the standpoint of the authority and responsibility of both parties (the MSCs and centers) with regard to the tracking and controlling of collections for which they are each responsible.

ManTech's understanding of the MSC READS databases are that the databases contain Now Has records for outstanding loans, but do not retain Has Hads for past loans (although they do retain basic patron data from prior loans). Therefore, there is no necessity for transferring patron Has Hads from the MSCs to the primary center, but there may be some merit to transferring Now Has data from the perspective of developing the most comprehensive type of service possible, although this is not a specified requirement. Reserves outstanding at the MSCs at the time of conversion should also be transferred to the primary center, in READS format, at this time so that the reserves can be fulfilled as soon as the subject books are converted into the centers' collections and are made available for issue.

6.7 INFORM PATRONS OF CONVERSION

At this stage in the implementation transition, it is recommended that NLS, the centers, and the network libraries each inform all braille patrons of the national library service about the impending conversion to the specified centralized operations. Although this will not have been the first notification the patrons will have received on the subject (it was recommended that after all "fundamental" decisions were made, and that an initial transition plan was documented, that initial notification be given to patrons via newsletter (ref. Section 2.8)), considerably more information will be available to promulgate at this time.

Information promulgated to patrons should include the order in which the braille patrons and BR collections are to be converted to centralized service, and specifically the tentative conversion date(s) for the affected patron; this notification should be communicated by the network libraries. Information should also be distributed which describes the ADP system *vis-a-vis* the options and features it offers to patrons; this step is described in detail in Section 3 of this report, and should be sent out by the primary center. Lastly, NLS should promulgate a general, overall notification via newsletter that summarizes where the situation stands at that juncture, i.e. facilities, equipment, ADP systems and operations staff all up and running, MSC collections converted, and normal services ready to begin with patron and collection conversions from network braille libraries.

6.8 INITIAL PATRON DATA CONVERSION

The last task in the set-up of initial operations should be the population of the primary ADP system database with patron data obtained from the CMLS database. This action will load the primary center's database with basic, but not service preference specific, information.

However, prior to this initial download, network libraries will be requested to verify CMLS data for all their braille patrons. As a matter of standard operating procedure, this data should be complete and accurate anyway (it is the source of mailing labels for direct circulation magazines, and also serves as a general roster of national library service patrons). However, some libraries will need to review and edit this information if it is not up to date, or if it is inaccurate. Of particular importance is the presence of the "braille interest" code. Although the center's ADP system will get daily updates of changes from CMLS, it is highly desirable to make a concerted effort initially to load the center's database with "good" data. This cleanup effort is, however, not an incremental impact of braille centralization; it needs to be done anyway, where and when necessary. The quantification of this effort is not possible, though it is estimated as moderate (given the small percentage of total patronage that are braille readers), since there is no data available upon which to base an estimate.

After any clean-up and edit of the braille patron portion of the CMLS database by network libraries (an action date should be established for the completion of this activity), the ADP staff of the center must perform the initial download of relevant data from the CMLS database per the documented instructions in the ADP user/operations manual. The ability to perform this option completely automatically is a specified function of the ADP system. The download should take place the day following the specified and promulgated action date for CMLS record clean-up.

On a daily basis, and as a part of normal operations, the CMLS system will automatically transmit to the primary center ADP system changes to braille patron records only, and extract only the changed records, or possibly (TBD) only the changed data elements themselves. This capability is a specified function of the ADP system, and the ADP staff of the center will execute this function in accordance with the documented ADP systems procedures (if any job execution command is required at all).

With this basic patron data loaded into the center's ADP systems database, the circulation of specific titles to patrons, from any collections, can actually commence at this point. For instance, circulation from any of the special collections can begin at this point, or for that matter, from the BR collections that are already a part of the inventory. At this point, no patrons will yet have "officially" begun service directly with the centers for their requirements, but ILLs from network libraries could be serviced at this juncture.

SECTION 7

COMMENCE NORMAL OPERATIONS

Section 7

COMMENCE NORMAL OPERATIONS

This section of the transition plan report presents issues and recommendations pertinent to the commencement of normal operations that will be required to successfully implement the specified centralized braille services. The activities in this phase of the implementation cannot commence until all steps outlined in Sections 2 through 6 of this report have been performed.

7.1 PHASED PATRON CONVERSION

The recommended rollover plan from the current system to the specified system is phased, and should take place over a period of four years from the time of initial CMLS download and completion of MSC collections conversions, which should be timed to coincide as closely as possible. Conversion refers to both patrons of network libraries, of which there are approximately 16,000 (14,700 individuals and 1,300 institutions), and NLS produced BR books in network libraries, of which there are approximately 1,000,000 volumes. A four-year conversion, therefore, equates to an average annual conversion rate of 4,000 patrons and 250,000 volumes; this is, of course, based upon the assumption of total participation by network libraries.

NLS has directed that ManTech not specify a tentative conversion order for the braille network libraries, but rather that NLS and the network will make that determination. It is, therefore, simply recommended that the above "targets" for uniform conversion of patrons and books over the four-year time frame be adhered to as closely as possible. When the schedule is formulated and finalized, it should be promulgated to the network and to patrons by the NLS.

The primary center will require reader history data from the servicing braille network libraries, when available, in order to provide the RA services most effectively, and to perform the profile select function. Has Had, Has Now (which would be rolled in with Has Hads for the center's purposes), reserve, and request data, preferably in the form of machine readable data, else in hardcopy, should be transferred to the primary center at the time of conversion. It is recommended that patrons do not return the books issued by network libraries directly to the centers, but rather that patrons return the books to the issuing network libraries, and that the libraries issue all books to the centers in a formal transfer whereby the inventory records of the books are closed-out at the libraries. In this manner, the responsibilities and authorities of the libraries and centers are not intertwined with regard to the inventory control of NLS owned property.

There may be merit to developing a special computer program(s) to facilitate data extraction of reader histories and standing orders from network libraries' systems, but the first attempt by one or a few libraries should simply be to output to a flat ASCII file data in a format specified by the center. If this fails, the focus should be upon where NLS/network could get their greatest quantity of patron data converted given the variety and divergence of ADP systems used in the network; this would probably involve developing a program for the DRA and READS systems. The costs of manual input of the subject data is estimated and shown in the specifications report. ManTech, having limited knowledge of the specifics of these two systems, cannot recommend whether to proceed with development of such utilities. The magnitude of this cost is not significant in the overall scheme of the proposed implementation, and while it is not recommended that NLS fund development of such programs for systems other than the two cited above given the quantity of such other systems, the owners of other systems may be able to provide the needed data with minimal to moderate effort in some cases.

With the patron history and reserve/request data extracted and written to some form of machine readable media, and/or printed out by the network library undergoing conversion, the information should be forwarded to the primary center for loading into the ADP system patron database. ADP systems personnel will then either load the data into the system via documented (or improvised, in some cases) procedures, or alternatively clerical or RA staff will key enter the data into the system. The integrity and accuracy of the converted patron data will be verified as required, and edited as necessary.

At this juncture, the ADP system database at the primary center will contain basic data on all patrons, and patron history and reserve/request data for patrons of the libraries being converted at that time. The last data required to complete the patron record in the database is to be obtained via direct telephone (or written/brailled) survey, which is both to elicit from the patrons their subject interests and subject restrictor preferences, and to establish liaison with the patrons. This information will be directly key entered into the ADP system by RAs per documented user instructions during the telephone survey, or entered from forms by the clerks. An average of 16 patrons must be surveyed each working day in order to convert 4,000 per year. It is recommended that network libraries continue to provide all normal (i.e. BR collection) circulation services to patrons during this patron information conversion process, as they will still have complete BR collections during this interval. Upon the commencement of collection conversion, at an individual library, it is recommended that the provision of service be shifted to the centers.

7.2 PHASED COLLECTION CONVERSION

As previously mentioned, the recommended rollover conversion plan for the network library BR collections is phased to convert them uniformly over a four-year period at the same time that patrons from those same libraries are being converted to the centralized service. Approximately 250,000 volumes per year must be converted per the operations specifications procedures for this activity, which involves: affixing a bar code label to both the spine and inside cover of each volume to uniquely identify it; key entering the title id number and volume number in the hand-held scanning unit to link it to the bibliographic and inventory records of the books; and, scanning the bar code on the both the volume spine and its location on the forward shelves to fix its location within the facility given the random storage scheme.

In accordance with the conversion schedule to be established by NLS, each participating network library will forward to the appropriate center their NLS produced BR collection. As previously discussed, it is recommended that patrons of the network libraries return all books on loan to the network libraries after use, and that the books be issued from the libraries to the centers via a formal transfer; this will avoid the responsibilities and authorities of the centers and libraries from becoming entangled vis-a-vis inventory control of NLS property. This formal transfer will, at a minimum, clear the inventory record in the library's system of the item and could, hopefully, generate some type of a *de facto* packing list to accompany the shipment to the centers (the libraries should also keep a copy of the packing lists). NLS will supply specific information to the network braille libraries regarding the packing and shipping of the BR collections. The libraries would either use gaylords supplied by NLS, or Bulk Mail Containers supplied by the USPS; NLS must consult with the USPS as to which method should be employed. The network libraries would be responsible for the actual packing, and the books would be shipped "free matter" by the USPS. Only NLS produced and owned braille will be shipped to the centers, and all other braille books and/or magazines will remain in the custody and control of the network libraries. As additional BR books are returned by patrons to the network braille libraries, the Has Now records of those patrons will be cleared by the libraries and the books will be batched and formally transferred to the centers along with transmittal listings. All overdue books issued by regional libraries to their patrons will be tracked and retrieved by those same regional libraries so that the centers do not inherit overdues from the network libraries during the collection conversion process.

Because MSC books will be converted into the centers' inventories prior to the conversion of any patrons, patrons can begin to receive service from the centers prior to all of their libraries' collections being converted into the centers' inventories. However, the network libraries could continue to serve patrons after the beginning of their own collection conversion, but this is not recommended and the transfer of inventory must proceed on schedule, regardless of which portion of the inventory is transferred to the centers first, or last. If this option is exercised, however, at some point in the conversion the library collection will become too small to do justice to the patrons and they will be informed to seek service exclusively from the centers (if a non-RARL), or to continue service contact with the library, but that books will henceforth only be issued from the centers, and not from the library.

Upon completion of the phased conversion of collections and patrons from the network, the centers will provide continuing services and support operations per the documented operations specifications as modified by NLS. Because the very nature of the specified service is customer oriented, the performance of the operators and the quality of services provided must be closely monitored by the NLS, and this is the subject of the next section.

SECTION 8

MONITOR AND MODIFY OPERATIONS

Section 8

MONITOR OPERATIONS

This section of the transition plan report presents issues and recommendations pertinent to the monitoring of operations at the centers that will be required to ensure the successful provision of the specified centralized braille services to patrons of the national library service.

8.1 MONITORING BY NLS

As discussed in Section 2.2 of this report, unless NLS and participating network libraries form a legal entity to oversee the operations of the centers and hold lease and title over all, or some, of the assets used in the operations, the NLS will both hold lease and/or title over the centers' assets, and will have a direct contractual relationship with the centers' operators. Therefore, it will be incumbent upon NLS to directly monitor the centers' operations in order to ensure that the type of customer responsive service documented in the specifications is being provided to patrons, and that service performance goals are being met.

The criteria upon which to monitor and base evaluations of the contractors' performances are adherence to the specifications as documented (and/or as modified by NLS subsequent to this study), including the specific service performance goals of one working day turnaround of orders, the provision of excellent RA services, and minimal waiting time on the toll-free lines during normal hours; and, the administrative requirements of reporting center activity and performance to the NLS. There are three types of monitoring processes that are recommended for the NLS to employ with regard to the above.

There will be several types of management and statistical reports periodically furnished to the NLS by the centers' operators, as specified by NLS and/or as produced by the ADP system, that are contractual obligations of the operators. There will be activity reports, which present workload handled by the centers, such as telephone calls received, orders shipped, volumes received, etc. Additionally, there will be information on readership, circulation, and collections (including inventory reconciliations and physical inventory results) that will greatly aid the NLS in production planning and copy allotment decision making. Initially, NLS will continue to produce books in the same quantities as are currently being produced, but will use the circulation statistics compiled by the centers in future production planning; after sufficient data is available, books forecasted to be relatively less popular will be produced in fewer copies, and books forecasted to be relatively more popular will be produced in higher quantities. Finally, there will be reports that present changes in operations staff, which require NLS approval, reports that document any problems, potential problems, and/or potential solutions and/or corrective actions taken to remedy such problems, and reports which provide recommendations by the operators concerning any perceived required capital investments that should be undertaken, and the reasoning for such investments. Some data will be reported quarterly, some annually, and some on an as-required basis. Responsible individuals within the NLS will have to review these reports, respond to action items that require an NLS response, and formulate overall evaluations of the performances of the operations contractors with regard to contract compliance and/or the possible need to modify some aspect, or aspects, of the subject operations.

The second type of monitoring that NLS should employ are actual, periodic visits to the centers to observe operations and meet with center management and staff. The centers' operators are contractually obligated to cooperate with the NLS in semiannual review and assistance visits, and must have the centers' working files available for review by the NLS representatives during such visits. The visits will be conducted to evaluate operations, and NLS will furnish the centers' operators with written reports, recommendations, and/or instructions as appropriate. In this manner, the NLS can both evaluate the centers' operations first-hand for contract monitoring purposes, and can additionally provide useful feedback and/or "marching orders" to the contractors as necessary.

The third type of monitoring that NLS should employ is the evaluation of direct feedback from patrons and network libraries regarding the quality of services being provided by the centers, and specifically any problems that have been encountered, and any potential suggestions or solutions to such problems. Some feedback will inevitably be unsolicited telephone calls and/or letters from patrons and libraries directly to the NLS, and some feedback will be provided to NLS at the biennial and regional conferences that both NLS and the centers' operations managers are required to attend.

8.2 MONITORING BY ADVISORY COMMITTEE

Per the operations specifications for the centers, an advisory committee will be formed to provide guidance to both NLS and the braille centers' directors on the services provided by the centers. This committee will be composed of representatives from the major blindness organizations, librarians from participating libraries in each of the four regions of the U.S., braille readers from two of the four regions (alternating with the other regions in staggered two-year terms), the two center directors, and NLS representative(s). The committee shall meet quarterly at the primary center, at least for the first two years of the operation of the centers, beginning with the set-up of operations, and no less than twice annually thereafter.

In advance of each meeting, NLS should provide relevant management, statistical, and/or special reports on the centers' operations as background material to the meeting attendants. The objectives of the meetings will be to evaluate the performance of the centers with respect to the specifications and established goals for the service, enumerate any problems that patrons and/or libraries are encountering with the service, suggest and recommend potential solutions and courses of action that should or must be followed by the operators to mitigate or eliminate the problems, and address any strategic considerations. Policy questions such as the establishment and/or modifications of book loan quantity limits, book loan time limits, and overdue book enforcement procedures will also be addressed at these meetings.

As noted above, the advisory committee members would be selected during the facilities and shelving set-up phase, and would hold their first meeting in the set-up operations phase shortly after award of the operations contracts. In this early stage of the implementation, the committee members would be directly involved in the planning and goal-setting stage of transition before operations staff are hired (or redeployed) by the operators, and before staff are trained by the ADP systems contractor on the use of the ADP systems, by the NLS on general service and customer orientation issues, by the mobile shelving contractor on the use, repair, and maintenance of the mobile shelving, and by the buildings' owners or lessors on the layout of the facilities, safety issues, and the buildings' physical plants. The committee members would, therefore, be present at the "inception" of operations and thus would have the ability to make informed decisions regarding the contractors' performances and the need for any subsequent modifications of operations at either center.

8.3 MODIFICATIONS TO OPERATIONS

Depending upon a number of factors, it may be necessary to modify the operations at the specified braille centers in one or several ways after operations have commenced. These required modifications could potentially result from changes in patron needs, changes in technology, inability of the operators to meet performance goals with deployed resources and established operating procedures, and possibly for other reasons. There will be essentially three basic types of modifications that could, at various times, be required in the subject operations.

The first type of modifications will consist of relatively minor changes to operations that are within the scope of the operations contracts as currently written. Such modifications may include changes to operating procedures in the floor or office functional areas, or any similar changes that do not require the deployment of significantly more, or different, resources than the operations contractors bid in their proposals to operate the centers. These types of modifications would generally create no, or minor, cost impacts.

The second type of modifications are those that are clearly outside the scope of the operations contracts as written, and require significant changes in the types of resources used in operations, resource availabilities, and/or operating procedures. These types of modifications will require changes to the operations contracts, with cost impacts that may or may not be relatively significant depending upon the specific requirements. Such contract modifications will necessitate the involvement of the LOC procurement operations.

The third type of modifications to operations are those that necessitate any significant capital investments in the operations, whether impacting the operations contractors specifically, or the facilities, shelving, and/or other equipment. Considerations of these types of modifications will only result from a compelling, rather than a perceived, need for such capital investments. If such enhancements are recommended by the centers' operators, the operators must document the logic of the request, including the expected costs and benefits of the proposed improvement(s). Hopefully, the resource requirements as documented in the specifications will suffice for years to come, but due to technological changes and/or unforeseen circumstances at the centers, some additional capital investments may be necessary at the centers. The operators of the centers will not be authorized to unilaterally make such important decisions (NLS will), but will offer their input, ideas, and concerns to NLS in this regard.

SECTION 9

ESTIMATED COSTS FOR TRANSITION STEPS

Section 9

ESTIMATED COSTS FOR TRANSITION

This section of the report addresses the expected expenditures associated with transitioning to the specified centralized braille services. Depending upon the decisions made by the NLS and network relating to various issues presented in this report, transition costs could vary significantly. Depending upon these final decisions, all costs exhibited in this section may have to be revisited. Estimated costs are presented only for those efforts that would be contracted, as opposed to those tasks performed by NLS in-house, i.e., procurement, coordination, planning, etc., and costs addressed in previous reports are not reiterated in this report.

9.1 TRAINING

The personnel at each of the two centers will require training on the new system. This could be accomplished in one of two ways; either the center personnel on the User Review Board could perform the training, or the ADP systems development contractor could accomplish this task. If the contractor were to perform this effort, the costs would be approximately $4,400. This figure assumes a trainer at $30.00 per hour for 10 days, and $1,000 for travel to each center. The labor costs for the centers operators' personnel are already accounted for in operations costs and are thus not separately itemized.

Costs are not estimated for the training of network library RAs for two reasons; (1) it is unknown how many, if any, network braille libraries will choose to retain RA services locally and make the necessary modifications to their ADP systems to facilitate data telecommunications with the primary ADP system, and (2) this option is discretionary on the part of the libraries, i.e. they do not have to do this, and the costs presented by ManTech in the Options and Specifications reports made this assumption in the calculation of RA staffing and telecommunications costs for the centers (which assume that all patrons are serviced by the centers, and these costs would have to be recalculated if this assumption is violated).

Costs for NLS conducted instruction on customer orientation and blindness issues for the centers' staffs are also not presented for two reasons; (1) these are not contracted costs, and (2) depending upon who is the selected contractor, if they have experience in these areas, any NLS conducted training requirements will be minimal.

Finally, training costs associated with the mobile shelving and facilities layouts and safety features are incidental compared to the costs of the assets, and the training requirements are also significantly less than that for ADP systems.

9.2 ADVISORY COMMITTEE MEETINGS

There will be an Advisory Committee for the centers that will assist the centers' operators in guaranteeing quality service to braille patrons; the composition of this committee was previously described in Section 8.2. The committee will meet four times each year for the first two years. Costs have been estimated for the first two years at $700 per individual, per trip, with a 5% inflation factor applied for the second year. These costs will be approximately $25,200 for the first year, and $26,460 for the second year. These figures represent only travel costs associated with these meetings, and represent expenses for nine people.

9.3 USER REVIEW BOARD MEETING

During the course of the ADP system design and development there would be, at a minimum, six User Review Board meetings at one week each for four people. This total cost would be approximately $42,500, which consists of $24,000 in travel expenses, and $18,500 in labor costs. This figure is based on an average salary of $40,000 (loaded) per year, per individual, and an estimated travel cost of $1,000 per person, per trip.

9.4 SITE SELECTION

The site locations wherein the centers will be physically located, within the cities already agreed upon (Salt Lake City and Cincinnati), will have to be selected. Should NLS have involvement in actually selecting a building construction site, for the "build-to-order" scenario to lease or purchase a building, there would be an effort related to pin-pointing the best locations. NLS may find it beneficial to contract this effort to a commercial real estate firm familiar with the areas. Based on an hourly arrangement, the cost would be approximately $15,000 for both sites. This figure is based upon an hourly rate of $125 per hour, requiring seven-and-a-half days for each site. This hourly rate is based upon the Washington area, and will probably be somewhat less in Salt Lake City and Cincinnati.

9.5 HARDWARE, SOFTWARE AND TELECOMMUNICATIONS ANALYSIS

As mentioned in the ADP Issues section of this report, there will most likely be a lapse in time between the creation of the ADP systems specifications, previously developed, and the actual design and development of the ADP systems to support the centralized system. It can be expected that considerable technology changes will take place in software, hardware, and telecommunications during this time frame. Although it is normal to reevaluate requirements prior to design, the costs associated with this effort were not taken into account in the cost estimates contained in the specifications report. This cost would be approximately $30,000 depending on the final decisions reached by the NLS.

9.6 PERFORMANCE BOND

The NLS may wish to add a requirement to the ADP procurement that the successful bidder acquire a performance bond, at a cost to the government, prior to the start of the contract. The performance bond will cover the contract period of performance for the total contract award quote. The estimated cost for the performance bond is based upon an average rate, and represents what a bond would cost given the proposed costs. The performance bond costs will vary depending on the final contract awarded price quote. A bond for the centralized braille ADP system development effort would be approximately $6,000. This figure represents a contract award price of $400,000 (software, hardware, and the re-evaluation mentioned above) at a bond rate of 1.5%, with the bond rate varying depending upon several variables, one being how bondable the contractor is.

SECTION 10

TRANSITION PLANNING AND CONTROL

Section 10

TRANSITION PLANNING AND CONTROL

This section of the report details how the NLS can direct the transition to the new mode of operation. An overview is first presented that summarizes the seven major implementation steps and the order of their performance. Then, this generalized sequencing is further refined so that the important tasks, decisions and documents within each of the seven steps are detailed in the form of a graphical flowchart. Finally, a transition activities checklist is provided.

10.1 SEVEN STEPS TO TRANSITION

The NLS will need to take seven major steps to implement the centralized braille distribution operation as specified. These seven steps are:

- make fundamental decisions,
- implement ADP system,
- obtain facilities, shelves and equipment,
- procure services of center contractor(s),
- set-up operations,
- commence normal operations, and
- monitor on-going operations.

The work to be accomplished in each of these seven areas has been fully detailed in the corresponding report sections, so what the NLS needs to do will not be repeated here, but rather the sequencing of events will be discussed so that how the individual components of the transition contribute to the whole will be better understood.

Exhibit 10-1 shows the overall plan for executing the transition to the specified operations. Roughly speaking, there are four activities that are performed sequentially and three activities that are performed in parallel. The four sequentially performed activities are:

- Make fundamental decisions,
- set-up operations,
- commence normal operations,
- monitor on-going operations.

The three activities that can be performed in parallel are:

- Implement ADP system,
- obtain facilities, shelves and equipment,
- procure services of center contractor(s).

Obviously, none of the rest of the plan can be executed until NLS makes its fundamental decisions regarding whether to adopt centralization, where to centralize, and so forth. These decisions enumerated in Section 2 of the report must be accomplished first before any work and resources can be devoted to the other areas of endeavor.

Once the NLS makes the fundamental decisions, the transition moves into work on the long lead-time items that are to be performed roughly in parallel. In our estimation, the longest lead-time item is the ADP system design, development and testing. Work on this area should proceed first and should be expected to last approximately two and one-half to three years (including writing the RFP, obtaining funding, and the other internal things that NLS must accomplish that will require lead times of their own.)

The second longest lead-time item will be the procurement of the facilities, shelves and other equipment. This task may actually be four separate tasks in which the two facilities are obtained separately, and the shelves and general equipment are each obtained in a separate buy. Timing for completion should be such that the building is ready to accept first the shelves, then the general equipment, and lastly, the ADP equipment. Estimated total time for completion of this task is about two years.

The last of the three parallel activities is the procurement of the services to operate the centers. There may be one or two awards made, but probably only one procurement package needs to be assembled. It will be extremely important to distinguish the roles and responsibilities of the contractors if there is more than one award made. It is estimated that this work can be accomplished in 12 to 18 months and that the award should be made so that the contractor(s) is ready to occupy the facilities within a very short time frame after their completion.

After the operations contract(s) has been let, then the last three activities can be performed, and in their appropriate sequence. Since these three activities are absolutely sequential, their are no crucial coordination issues to address. However, the set-up operations activity should be scheduled to last long-enough for the contractor to become fully prepared to take over operations. From our viewpoint, the extra costs of a few weeks of training and preparation are more than justified. There will be patrons that are to be served first by the centers, and they should not be "guinea pigs".

10.2 TRANSITION ACTIVITIES FLOWCHART

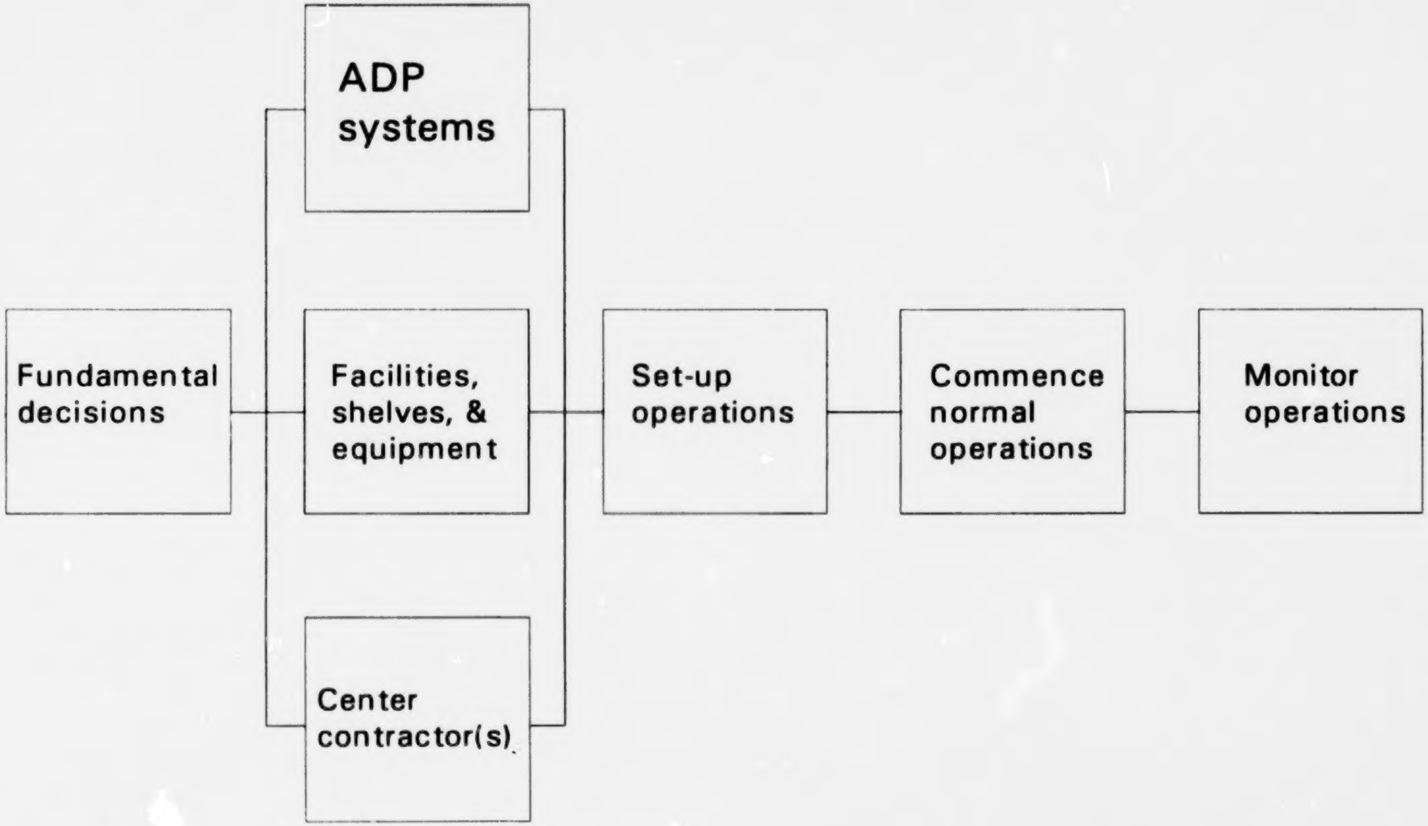
Exhibit 10-2 is a detailed flowchart for the major events and activities that take place within the seven transition steps. The flowchart is a graphical summary of the narrative of the report sections and is organized to show the decisions, tasks and documents that are part of the transition process. Decisions are displayed as diamond shapes, tasks as rectangles, and documents as irregular parallelograms.

10.3 TRANSITION ACTIVITIES CHECKLIST

Exhibit 10-3 is a checklist of the activities displayed in the flowchart. It is designed to be a tool to help NLS monitor the status of the transition.

Exhibit 10-1

SEVEN STEPS TO TRANSITION


Fundamental decisions

ADP systems

Facilities, shelves, & equipment

Center contractor(s)

Set-up operations

Commence normal operations

Monitor operations

Exhibit 10-2
TRANSITION ACTIVITIES FLOWCHART

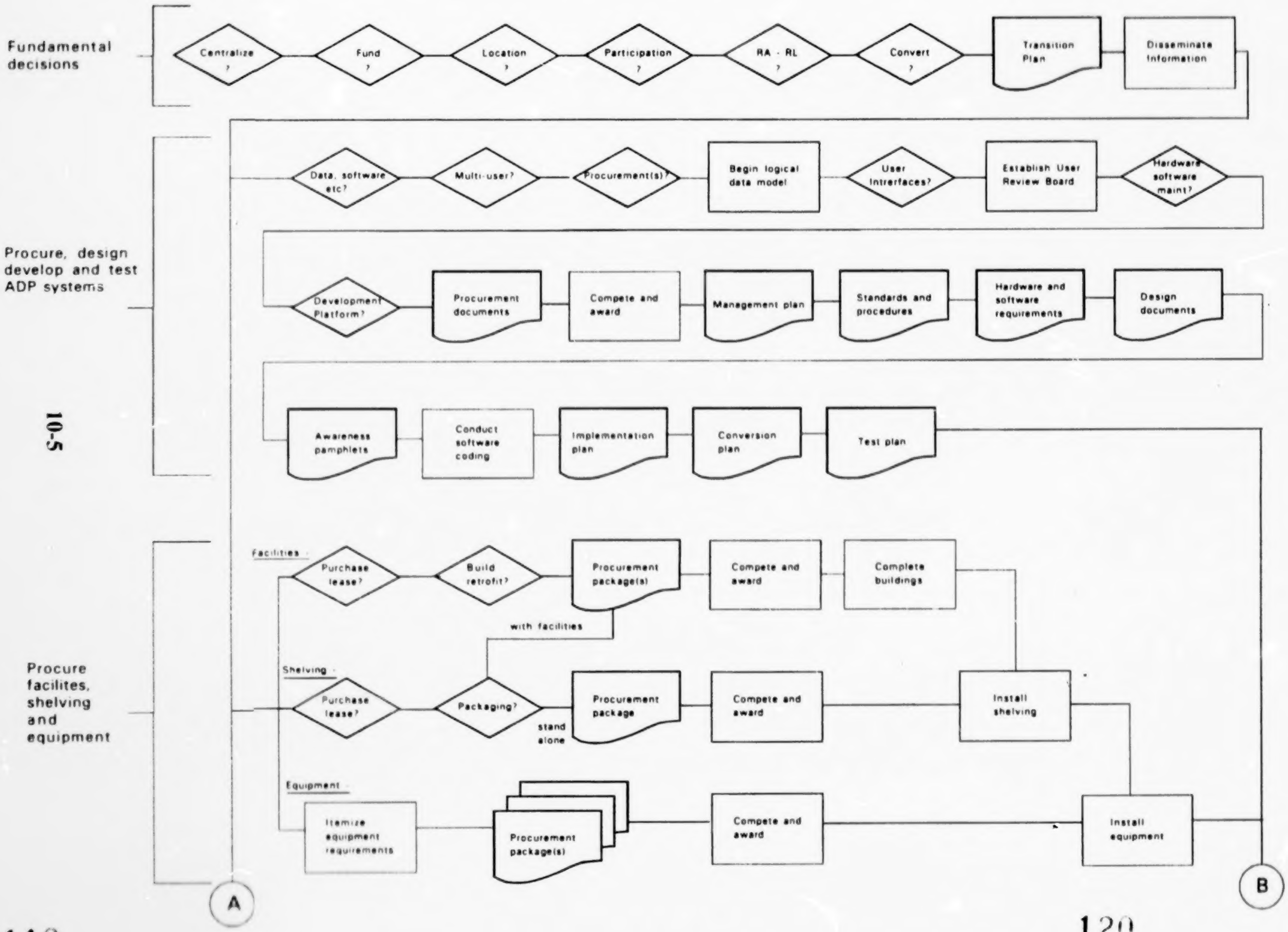

Fundamental decisions
Centralize ?
Fund ?
Location ?
Participation ?
RA - RL ?
Convert ?
Transition Plan
Disseminate Information
Procure, design develop and test ADP systems
Data, software etc?
Multi-user?
Procurement(s)?
Begin logical data model
User Interfaces?
Establish User Review Board
Hardware software maint?
Development Platform?
Procurement documents
Compete and award
Management plan
Standards and procedures
Hardware and software requirements
Design documents
Awareness pamphlets
Conduct software coding
Implementation plan
Conversion plan
Test plan
Procure facilites, shelving and equipment
Facilities -
Purchase lease?
Build retrofit?
Procurement package(s)
Compete and award
Complete buildings
with facilities
Shelving -
Purchase lease?
Packaging?
stand alone
Procurement package
Compete and award
Install shelving
Equipment -
Itemize equipment requirements
Procurement package(s)
Compete and award
Install equipment
A
B

Exhibit 10-2 (Continued)

TRANSITION ACTIVITIES FLOWCHART

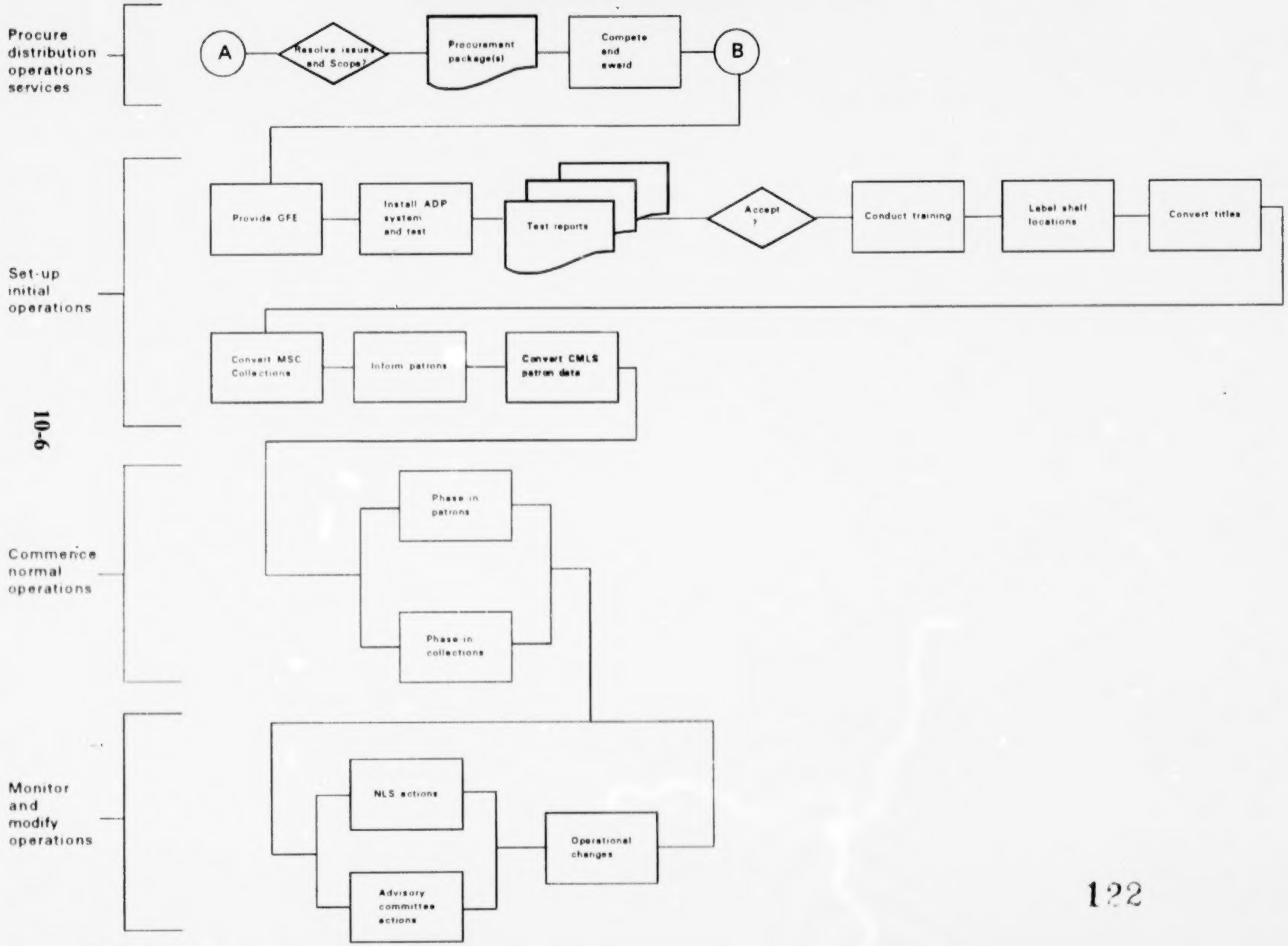

Procure distribution operations services
A
Resolve issues and Scope?
Procurement package(s)
Compete and award
B
Set-up initial operations
Provide GFE
Install ADP system and test
Test reports
Accept ?
Conduct training
Label shelf locations
Convert titles
Convert MSC Collections
Inform patrons
Convert CMLS patron data
Commence normal operations
Phase in patrons
Phase in collections
Monitor and modify operations
NLS actions
Advisory committee actions
Operational changes

Exhibit 10-3

TRANSITION ACTIVITIES CHECK LIST

Activity	Responsible Personnel	Due Date	Current Status	Comments
1.0 Make fundamental decisions				
1.1 Centralize?				
1.2 Funding?				
1.3 Primary site location?				
1.4 RL's participation?				
1.5 RL's with RA's?				
1.6 Conversion?				
1.7 Develop Transition Plan				
1.8 Disseminate Information				
2.0 Procure, design, develop and test ADP systems				
2.1 Make decisions and take initial actions				
2.1.1 Data, software architecture and operating environment?				
2.1.2 Multi-user distributed environment?				
2.1.3 Procurement strategy?				
2.1.4 Begin logical data model				

Exhibit 10-3 (Continued)

Activity	Responsible Personnel	Due Date	Current Status	Comments
2.1.5 User interface decisions?				
2.1.6 Establish URB				
2.1.7 Hardware and software maintenance?				
2.1.8 Development platform?				
2.2 Procure ADP services				
2.2.1 Prepare procurement package(s)				
2.2.2 Compete and award				
2.3 Design Phase-Definition Stage				
2.3.1 Prepare management plan				
2.3.2 Develop standards and procedures				
2.3.3 Define hardware and software requirements				
2.4 Design Phase - Design Stage				
2.4.1 Prepare design documents				
2.4.2 Prepare awareness pamphlets				

Exhibit 10-3 (Continued)

Activity	Responsible Personnel	Due Date	Current Status	Comments
2.5 Development Phase - Programming Stage				
2.5.1 Conduct software coding				
2.5.2 Prepare implementation plan				
2.5.3 Prepare conversion plan				
2.5.4 Prepare test plan				
2.6 Development Phase - Testing Stage --- See item 5.0, Set-up initial operations				
3.0 Procure facilities, shelving and equipment				
3.1 Facilities				
3.1.1 Purchase-lease?				
3.1.2 Build-retrofit?				
3.1.3 Develop procurement package				
3.1.4 Compete and award				
3.1.5 Complete building				
3.2 Shelving				
3.2.1 Purchase-lease?				

Exhibit 10-3 (Continued)

Activity	Responsible Personnel	Due Date	Current Status	Comments
3.2.2 Package w/ building?				
3.2.3 Develop procurement package				
3.2.4 Compete and award				
3.2.5 Install shelving				
3.3 Equipment				
3.3.1 Itemize requirements				
3.3.2 Develop procurement package(s)				
3.3.3 Compete and award				
3.3.4 Install equipment				
4.0 Procure distribution contractor services				
4.1 Resolve issues and settle scope				
4.2 Develop procurement package				
4.3 Compete and award				
5.0 Set-up initial operations				
5.1 Provide GFE				

Exhibit 10-3 (Continued)

Activity	Responsible Personnel	Due Date	Current Status	Comments
5.2 Install ADP systems and conduct tests through acceptance				
5.3 Prepare test reports				
5.4 Accept?				
5.5 Conduct training				
5.6 Label shelf locations				
5.7 Convert titles				
5.8 Convert MSC collections				
5.9 Inform patrons				
5.10 Convert CMLS patron data				
6.0 Commence normal operations				
6.1 Phase-in patrons				
6.2 Phase-in collections				
7.0 Monitor and modify operations				
7.1 NLS				
7.2 Advisory committee				
7.3 Operational Changes				